

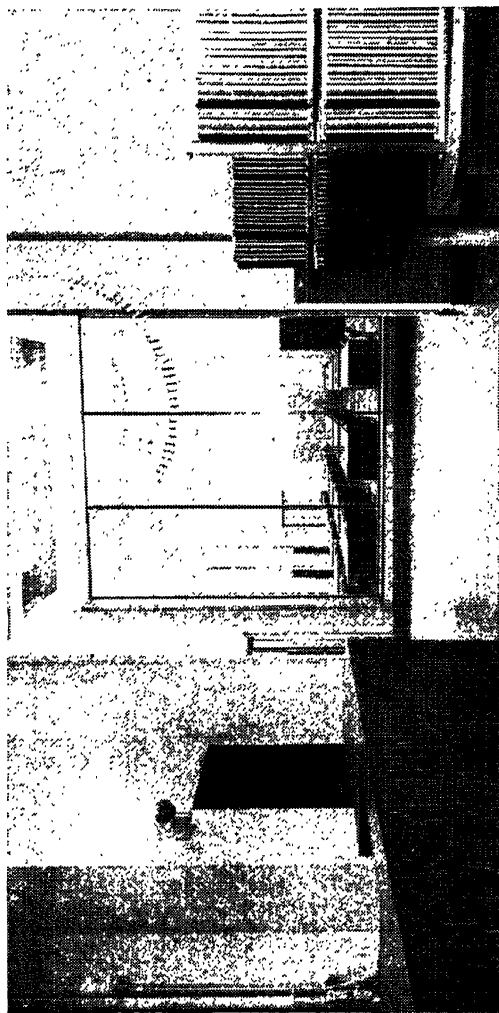
MAISON DE LA CHIMIE, PARIS

This documentation centre well exemplifies the modern *instrument de recherche scientifique*. The above illustration shows the entrance to the *Salle de Lecture*. Note the librarian's desk on the left, with pneumatic tubes for the readers' call-slips; on the other side are the pivoted frames of the card-index, described on p. 56.

LIBRARIES
FOR
SCIENTIFIC RESEARCH
IN EUROPE AND AMERICA

by
H. PHILIP SPRATT
B.Sc., A.I.Mech.E., London
A.S.M.E., New York
V.D.I., Berlin

LONDON
GRAFTON & CO.
1936



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ST. GILES WORKS, NORWICH

To
THE MEMORY OF MY DEAR
FATHER
WHO DIED BEFORE IT WAS FINISHED
THIS LITTLE WORK IS DEDICATED

P R E F A C E

THE libraries for scientific research which I have had the pleasure to visit on various European tours, and in the New World, have been studied from a dual point of view: that of reader and librarian. As a scientific worker, I have been interested in the facilities for research offered to readers in the various libraries visited; while as a librarian, I have had special *entrée* to the more intimate details of their administration. The descriptions in this little book of mine (the outcome of such dual studies) are therefore written from both points of view, and in the hope that the first-hand information which I have been able to collect will prove useful to research workers and to librarians alike; or in other words, to my readers on both sides of the card-index.

For scientific research workers, I hope that it will be useful as an explanation of the facilities which are offered in modern libraries and documentation centres, and how we librarians endeavour to assist them in the quest for published information, even in the most specialised fields. The librarian will *not* find here a text-book on librarianship; however, in the course of the descriptions, it will be seen that I have not hesitated to descend to such practical details of our work as appear to be, more often than not, beneath the notice of more learned writers.

For our present purposes, I shall have to abandon the usual definition of a library as "a place set apart to

contain books." It is the truth, but not the whole truth. Since the word "documentation" entered into our placid lives, there has been no peace for librarians. A friend once remarked to me in Paris, that a modern library should be an "*instrument de travail, et non pas cimetière d'imprimerie.*" That is the spirit, and the libraries which we now have to consider are in fact "*instruments de recherche scientifique.*" Such libraries transcend, and even contradict to some extent, their definitive function as places set apart to contain books; because books form, in fact, but a minor proportion of their contents.

To collect the material for a comprehensive text-book, and hammer it into a presentable manuscript, is tedious work for the conscientious author, and cannot be hurried. It follows that when his book has at last been printed and published, it is already out-of-date for the scientific research worker who wants to know what was done last week in his particular field. For such readers, continual reference must be made to the most recent articles in current periodicals; and this involves their humble servant (the scientific librarian) in those hectic scrambles to which the word "documentation" has been applied. Lest the prospect of peaceful repose in "a place set apart to contain books" should attract the innocent to our profession, let them be forewarned.

As a scientific librarian, it would be shameful for me to claim that our qualifications were above those for other branches of librarianship; but it must be admitted that with scientific literature, as opposed to what the Germans would call "*schöne Literatur,*" the subject-matter aspect is more important than the author. Now the compilation of an alphabetical author-index is more or less routine work, but the precise subject-matter

classification of scientific literature requires one to be specialist as well as librarian ; in short, a *super*-librarian. Moreover, scientific research is international, but (thanks to the Tower of Babel) its literature is not ; we must, therefore, be conversant with at least German and French, and if we can understand a little Italian, Russian or Scandinavian in addition, so much the better.

In this little book, I commence with a fairly full description of the Science Museum Library, our national library for pure and applied science in its widest sense ; and then proceed to consider some of the other important research libraries in London, which are more restricted as to their scope. After a pleasant hour in the air-liner, we discern the *Tour Eiffel* above the clouds, and swoop down upon our Parisian *confrères* to catch them at their scientific documentation. In the fourth chapter, we meander across the mad continent of Europe, into sane peaceful Scandinavia (an ideal environment for scientific research) ; from here a little steamer takes us to the forests and lakes of enchanted silence known as Finland or Suomi, and down to Helsinki where there are three libraries to attract our attention.

For the next chapter, we have to cross the last European frontier, one of barbed wire and red banners ; their sentiments appealed to me, and I would make a modified version of them to read "*Librarians of the world unite.*" After all, librarians are *workers* (even if not in the full Soviet sense), and we do strive toward international co-operation, at least in scientific research. For example, in the *Kniznaya Palata* at Moskva our comrades use the *classification décimale*, and its pure numerals are understandable to librarians of all nations, even if the queer Russian characters are not. We shall see the vehement nature of education and scientific librarianship

in this wonderful new Soviet Russia, and how admirable work is carried out under difficult conditions.

Chapter VI takes us across the Atlantic to the home of Dewey decimal classification (in actual fact, it is the Majestic which takes us across). On arrival in New York, I became so Yankee-minded that I bustled around and saw some 35 libraries, if not much else, in the short time available. As a result, the New World appeared to me in distorted form, as a vast continent full of cheerful people with metallic voices, in libraries of palatial size, built with American dollars (one was told the exact number), and run on the same efficient lines as their automatic snack-bars and steam-heated hotels. It was O.K.

Wherever I have visited libraries, I have found pleasant people in them ; some were adherents of the *Classification Décimale Universelle*, some were disciples of Dewey, and others were utter heathens ; but all of them (whether Nazis, Bolsheviks or Yankees) have suffered, and even welcomed, this inquisitive intruder who has pried all over their libraries and probed their inner secrets for the purpose of this little book ; my sincere thanks are due to all of them, too numerous to mention.

H. PHILIP SPRATT

SCIENCE MUSEUM, LONDON

November, 1935

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Libraries for Scientific Research

CHAPTER I

WORK IN THE SCIENCE MUSEUM LIBRARY

THE Science Museum Library is the British national central library devoted to all branches of pure and applied science. It is open free to the public, practically without restriction, from 10 a.m. to 5.50 p.m. on all week-days except bank holidays. Admission is by ticket, which can be obtained on written application to the "Director, Science Museum, London S.W.7," or by personal application at the entrance to the library. The aim of the library is to assist those occupied in scientific research work, and to render readily accessible the information contained in scientific and technical literature. The interdependence of the various branches of science has necessitated this central reference library of pure and applied science, in order to supplement the more restricted scope and difficult selective task of specialised libraries. The staff of the library (under the Director of the Science Museum) consists of a Keeper and three other administrative officers, all of whom are scientific specialists, four lady-assistants (also of university honours standard), and an operative personnel of 16 attendants. The accessions department, which is at present accommodated in a separate office, comprises a clerical staff of 11 under a clerical officer. At the outset, before we come to the serious matter of

this chapter (the "work" in the Science Museum Library), a brief account of its history will not be out of place.

HISTORICAL NOTE: The library owes its existence to Sir Henry de la Beche, who in 1843 contributed the whole of his valuable collection of scientific books to form its nucleus. This was subsequently increased with purchases and with numerous donations from scientific societies both in Great Britain and abroad, as well as from private donors. To meet the demands of the School of Mines, when that institution was founded in 1851, the collections were further developed into a library of natural science, unrivalled of its kind. In 1854 a special exhibition of educational appliances and books was held in London, and much of the material from this was afterwards handed over to the Science and Art Department, under whose auspices the (now) Science Museum was founded in 1857. This collection was placed in a portion of the museum's temporary iron structure, and accommodation for readers was also provided. The library was then further developed on the lines of an Educational Library, to which was added in 1876 the library that had been formed at the central office of the Committee of the Council on Education. The need of a national central library of science was realised as a result of the reconstitution of the Department of Science and Art, and from 1883 onward the scientific books of the Educational Library, enriched from various other sources, have formed what is now known as the Science Museum Library. Since that date, the scope of the library has comprised mathematics, the natural and physical sciences, and their applications ; or in other words, all branches of pure and technical science.

SURVEY OF PUBLICATIONS: An efficient accessions department should acquire most of the new publications within the special scope of the library on its own initiative, in order to anticipate readers' requirements, and thus avoid the inevitable delay which must occur when a publication has to be obtained in response to a requisition. For this purpose, a comprehensive survey of new publications is the first essential. From the commencement of the year 1931, such a current survey of the world's scientific and technical literature has been carried out in the Science Museum Library, based on the more important primary national book-lists which have already been annotated and listed for reference in one of the writer's recent articles.¹ The selection there quoted is not exhaustive; it lacks, for example, the Russian *Knizhnaya Letopis* (described on p. 122), which on account of its different alphabet requires separate treatment, but which in some respects approaches our ideal of what a primary (i.e. uncritical and non-specialised) national book-list should be.

CUMULATIVE INTERNATIONAL INDEX: The relevant items are carefully selected from these primary national book-lists, and assembled into a secondary (i.e. critical and specialised) international current index of the world's scientific and technical literature. Where references extracted from such diverse sources have to be intercalated into one uniform alphabetical series, formidable difficulties are encountered due to the present lamentable lack of international standardisation. For example, a German reference to certain publications of the *Deutsches Museum* had to have the town-name MUNICH added in accordance with our code, before it could be intercalated

¹ Spratt (H. Philip), "Technical science libraries." Year's Work in Librarianship, vol. VI (1933), chap. VII. Library Association, London, 1934.

into the index. No doubt a German visitor would expect to find the same publications under MUENCHEN, but he would be disappointed ; this example is therefore quoted, not as a complaint (we could hardly expect the Germans to use the word "Munich" for our special benefit), but to show what an enormous help it would be to librarians all over the world, if international standardisation would come to the help of international co-operation. With reference to practical aspects of the work involved in the compilation of this international card-index of scientific and technical literature, the fact that special one-sided editions of the primary national book-lists are in most cases unobtainable, emphasizes how little the requirements of librarians are provided for. The only alternative is, of course, to order two copies of each (double-sided) issue, since the selected references in these often overlap. The references are cut out and mounted on the international standard size index-cards, 125 × 75 mm. (5 × 3 in.), by a special hot-press method which does not distort the cards. A space of about 13 mm. (0.5 inch) is allowed between the top of the card and the top of the mounted reference, so that the latter can if necessary be re-headed to accord with the code of the library. This cumulative index contains at present about 30,000 entries, and continues to be built up at the rate of about 150 references per week.

ACQUISITION OF PUBLICATIONS: The above-mentioned index serves to provide necessary details as to price, date and place of publication, in order to complete the (often) inadequate information on readers' requisition forms ; and for this purpose it will continue to become more and more useful, until such time as most of the publications asked for will be dated subsequent to 1931, the year of its commencement. But an efficient

accessions department should anticipate readers' requirements and acquire publications on its own initiative, and here also this cumulative index fulfils a useful function as a basis for the selective acquisition of books either as purchases or presentations. The former are obtained from H.M. Stationery Office who act as intermediaries for the library; the annual purchase vote is nominally 3000 pounds (less national economy-cuts), and was in fact 2900 pounds (14,000 dollars) for the year 1935. The issue of orders for publications which have been selected for purchase is commercial routine which can be carried out with an unspecialised clerical staff, and this aspect need not concern us further here. For the presentations, the library has to thank numerous authors, editors and scientific institutions all over the world. As will be readily understood, this involves an extensive international correspondence, for which the additional use of French and German places the library in this respect on as international a basis as can reasonably be expected. The rate of accessions to the library is now 10,000 volumes per annum, of which about 8000 are presentations. Some 9000 current scientific periodicals are received.

REGISTRATION: All new acquisitions are entered on the card-indexes of the accessions department immediately on arrival. To check the current receipt of periodicals, a visible card index ² is used (Kardex system). This is very convenient in practice for the insertion of new entries, and the use of coloured celluloid indicators enables a continual survey of the receipt of current periodicals to be easily maintained. Publications which

² This system is also used in the *Bibliothèque Nationale* at Paris, to record and keep check of continuations and serial publications. See also: Schnack (Ingeborg), "Die Flachkartei in der Akzession." Zentralblatt für Bibliothekswesen, Jahr. 49, Heft 10 (Oktober, 1932), p. 488.

have been duly entered in the accessions department are passed up to the library, and are there stamped with their date of receipt. Purchases are stamped in red, and presentations in black.

CATALOGUE DEPARTMENT: The code used in the library is in all essentials the same as that of the British Museum, with certain small modifications. Text books are entered under the surname of the author; independent periodicals under their titles (definite and indefinite articles omitted); and the transactions of corporate bodies under the name of the respective town or country. The references are first hand-written on paper slips, 8×3.25 in. (i.e. one-quarter foolscap size), and contain full details of the publication with decimal classification number, size in centimetres, and month of acquisition into the library. These hand-written slips with main entries and cross-references are collected at the end of each week, and reproduced in the form of an accession list; this is subsequently cut up, and its individual entries each mounted on a standard card, 125×75 mm. (5×3 in.), for intercalation into the library's author and subject-matter card-indexes. The former contains at present about 172,000 entries, to which some 13,000 are added each year; the latter contains about 203,000 entries, with an annual increment of 16,000. References of all new periodical publications acquired in the library are added to a separate cumulative index, from which a revised edition of the "Hand list of current periodicals in the Science Museum Library" will be printed in the near future.

WEEKLY ACCESSION LISTS: Since the commencement of the year 1931, full particulars of the library accessions have been issued in the form of weekly lists, which contain references to all new publications received

in the library. The references are minutely classified in accordance with the *Classification Décimale Universelle* for co-operative utilisation. Generally, several classification numbers are provided for each reference, so that copies may be filed under all subjects with which the particular reference is concerned. The weekly lists of accessions are printed on one side only of the paper, so that the references can be readily cut up and mounted separately on index cards of the standard international size, 125 × 75 mm. (5 × 3 in.), and incorporated into a cumulative card-index, either alphabetically by author, or decimally by subject-matter. A brief key to the decimal classification is provided on the back cover of each list. The total number of references amounts to about 10,000 per year; so that these lists of accessions represent a valuable summary of current scientific and technical literature. References to important literature published abroad are comparatively numerous, and include many items not represented in any other current index to which access in Great Britain is available. The lists are issued in return for publications which the library desires to acquire, and their circulation at present amounts to about 120 copies per week.

BOOK-STORES: The national collections of the Science Museum Library now contain 250,000 volumes, to which are added about 10,000 each year. The main store, which is provided with an electric book-lift, has a floor area of 2500 square feet. Half of this space is occupied with 150 movable stacks, on rollers which run on steel rails let into the floor; while economical of floor space, these have been found to have drawbacks, and their use will, therefore, not be extended in the future. These movable stacks accommodate some 45,000 volumes of scientific transactions, which are shelved in alphabetical

order under the names of the towns or countries in which the respective societies or institutions are located (i.e. in accordance with the same code as that used for the library's author card-index). The other half of the main book-store is provided with fixed stacks which contain about 45,000 text books. These are shelved in broad subject-matter divisions in accordance with the decimal classification scheme, and within those broad divisions alphabetically under the name of the author. The library annex accommodates on fixed stacks about 25,000 volumes of independent periodicals (as distinct from transactions of societies), which are shelved in alphabetical order under their titles. A basement store contains the library's extensive collection of patent specifications, and such literature as is in relatively infrequent demand. The free space available for new books is now nearly exhausted, and temporary accommodation has had to be set apart to house accessions until the planned extensions are built.

LOANS DEPARTMENT: In order that the widest use may be made of the national collections, books are lent within the British Isles, to approved institutions at which scientific research is carried out, to students and research workers themselves via the libraries of their societies, institutions or universities, and to the public via the National Central Library. Loans are not issued direct to the public; and books which are rare or of exceptional value, works of reference, and the current parts of periodicals, are not available for loan outside the library premises. There are now about 350 institutions on the loan list, to whom some 18,000 books were issued in the course of last year. This loan list is maintained in the form of a card-index on 8×5 in. cards. Separate requisitions for each work must be made in

duplicate on the printed forms, books of which are issued to the approved institutions. When the work is issued on loan, one of these requisitions is shelved in its place as a check, and the other is filed in the card-index under the respective institution. Books on loan must be returned within two weeks, and a system of coloured tabs affixed to the requisitions in the card-index assures that a postcard reminder be issued to the respective institution when this period becomes due; in practice, it is found that such reminders are almost invariably required. As the bulk of the loans are ultimately for the use of practical research workers, it is necessary to emphasize that the books must not be used in laboratories or workshops where there is any risk of their deterioration; in some cases, it even has to be stipulated that the books shall only be used in the library of the respective institution, and not removed therefrom until it is returned to the Science Museum Library.

READING ROOM : This spacious hall is situated on the first floor. One enters between the cabinets of the author card-index which, like an avenue, lead up to the Superintendent's counter, where all newly acquired books are exhibited for the period of one month. This side which faces the entrance door, contains the windows, under which are shelved encyclopædias, technical dictionaries, and other standard works of reference. The opposite wall as well as the two end walls are lined with book shelves, nine deep on each of the two upper balconies, where about 35,000 volumes which form the older part of the collection of periodicals are shelved. The total floor area amounts to 3000 square feet, one-third of which is taken up with the cabinets of the subject-matter index described in the next section; the

other two-thirds provide accommodation for 72 readers. Last year there were 23,500 visitors to the library, and 28,500 books were issued to them. Readers are not permitted free access to the book-shelves; the available literature can be ascertained more readily from the card-indexes. All requisitions for books have to be made on the printed forms supplied, only one work on each form, which should then be handed to an attendant. The recent parts of some 500 current periodicals are placed at the immediate disposal of readers without requisition. Diffused illumination is used, and small electric lamps are placed in addition on the readers' tables. Two spiral staircases lead up to the main bookstore, and small doors in the two ends of the hall lead respectively to the administrative offices and to the library annex.

SUBJECT-MATTER INDEX: The library collects the scientific and technical references to books and to articles in periodicals extracted from all published documentation services which are classified in accordance with the *Classification Décimale Universelle*. These are incorporated, at the rate of about 150,000 entries per annum, into a colossal card-index which already contains well over two million cards³ of the international standard size, 125 × 75 mm. (5 × 3 in.), filed in 50 cabinets. Since these are systematically filed in very minute classes, readers are able readily to locate the articles on any specific subject under the respective classification number, which is first ascertained from the alphabetical catch-word index of subjects. This vast documentation also serves for the compilation of reference lists on specific subjects.

³ See also: Spratt (H. Philip), "Die Science Museum Library." *Zentralblatt für Bibliothekswesen*, Jahr. 52 (1935), Heft 8, p. 422.

INFORMATION SERVICE : Lists of references are compiled by the scientific staff of the library in answer to specific enquiries. Within their specialised subject-matter, these cover a wider survey than do the lists of accessions described on p. 20, because their references are not restricted to books and articles in the Science Museum Library, nor exclusively to current publications.

About 100 to 120 such lists are compiled each year, with a total of about 3000 references. It is of interest to note that two-thirds of the total number of enquiries received are for references on applied science. This service is free within the British Empire; otherwise, such lists are compiled at the rate of 2d. per reference, with 5s. as the minimum price of a list. In order to keep them within reasonable size, these reference lists compiled in the Science Museum Library must necessarily be selective from one or more points of view. One of the most extensive lists which has been produced in the library was that compiled in connection with the special Plastics Industry Exhibition, which opened at the Science Museum in April 1933. This contains a total of about 1500 references, in spite of the fact that its scope was restricted by the exclusion of ceramics, artificial stone, paints, varnishes and artificial silk. The first section (56 references) comprises a survey of already published reference lists on plastics. The library also publishes two serial or current reference lists: (i) Applied Geophysics, and (ii) Lubrication. These reference lists, as well as the weekly lists of accessions, are also issued in return for publications which the library desires to acquire. Photostat copies of articles or illustrations can be supplied at rates which are quoted on application. In its documentation and information

services, the Science Museum Library acts in close collaboration with the *Institut International de Documentation* (referred to on p. 69), for which it forms in fact an international centre for pure and applied science.

CHAPTER II

SPECIALISED SCIENCE LIBRARIES IN LONDON

WE will now proceed to consider a few of the more important specialised libraries for scientific research in London. Those of our three senior technical institutions are more restricted in scope, but cannot therefore claim to be more specialised, than the Science Museum Library (described in our previous chapter) which, both in its national collections and information service, endeavours to specialise at the same time in all branches of pure and technical science. This is, however, such an enormous task, that the three smaller libraries now under consideration have chance to be more comprehensive within their limited fields. The intimate inter-relation between the various branches of science causes such specialised libraries to overlap one another in a most wasteful manner; it also constitutes a *raison d'être* for such a comprehensive national collection as that of the Science Museum Library, to supplement the restricted scope and difficult selective task of smaller libraries which are (most of them) not open to the public.

The free national library of H.M. Patent Office is exceptional, both in function, and in the fact that the public have unrestricted open access to the shelves. Like most special libraries, its functions lie between those of a public library and those of an information bureau. Where the "man in the street" is admitted free, problems of administration do not differ much from those

of a public library ; on the other hand, where service to the technical specialist involves not only the collection and classification of all available relevant publications, but the compilation of records from scattered or even unprinted material, and the preparation of special reports in order to present the desired information from various sources in a more concise form, the "information bureau" end of the scale is approached. The last library to be described in this chapter specialises in certain branches of science (economics, statistics and political science) with which the Science Museum Library does not profess to deal, except in so far as such matters are intimately bound up with technical and industrial science.

No claim is made that this chapter is comprehensive ; five libraries have been chosen for description as representative of London, both in specialised scientific research and in librarianship. The writer has travelled abroad more than in his native country ; this is not due to lack of patriotism, but to a British love of travel, and an international outlook. As a result, he has seen more libraries in New York, for example, than in London. For a comprehensive review of *British* librarianship, however, the reader could be referred to a recent work of the writer's dear friend, Dr. Albert Predeek, director of the *Bibliothek der Technischen Hochschule* at Berlin (see p. 78). In that little book⁴ we are able "to see oursel's (in German) as ithers see us" in the mutilated words of our Scottish poet.

LIBRARY of the INSTITUTION OF MECHANICAL ENGINEERS : Founded in 1847, this institution had as

⁴ Predeek (Dr. Albert), "Das moderne englische Bibliothekswesen." Beiheft 66, Zentralblatt für Bibliothekswesen. 210 pp., 24 illus. Otto Harrassowitz, Leipzig, 1933.

its first president no less a man than Stephenson, inventor and builder of the first successful steam locomotive "Rocket" whose essential principles still dominate modern railway practice. The work of Stephenson recalls that fine British characteristic of stubborn unconquerable perseverance; a poor lad, without education, he has become immortalised in the "iron road" over the entire civilised world, whether it be as *le chemin de fer* or as *die Eisenbahn*. We have reason to be proud of Stephenson, and his institution which upholds the tradition of the mechanical profession in Great Britain; its membership is now well over 11,000 (of which number the writer happens to form a modest unit). The library is situated on the first floor, and is well lit from ample windows which look out over St. James's Park. There are three annexes to the main hall, which with its Elizabethan decoration and oaken imposts is beautiful rather than practical. The same applies to the bookcases around its walls, which have adjustable shelves, but could have been made to hold more books. In short, this is an architect's library rather than a librarian's, in contrast to the new *Schweizerische Landesbibliothek* at Bern (described on p. 89).

The collections amount at present to about 30,000 volumes, and some 500 current technical periodicals are received. Accessions are selected on the basis of their probable usefulness, rather than with an effort to be comprehensive; for example, of the super-abundant annual crop of relevant textbooks, not all are acquired, but every endeavour is made to select representative works on mechanical and allied subjects. Ancient books are not accumulated, as experience shows that the latest practice is required, rather than historical records. More than 200 sets of periodicals and transactions are

therefore preserved bound, and their contents rendered available with the help of various technical documentation services. Such modern material (both books and periodicals) is shelved in easily accessible positions, while older volumes are removed to the annexes to make place for them; the latter are, however, also available at once when needed. This quick service is due to the efficient methods of the librarian, Mr. Alfred R. Stock, who uses the Dewey decimal classification⁵ combined with an alphabetical catch-word subject index and abundant cross-references; both this and the author index are maintained on standard size (5 × 3 in.) cards.

Another valuable work of Mr. Stock consists in his annotated references of new accessions, which are published each month in the Journal, and keep members *au fait* with current technical literature. Of the enquiries received, some can be answered in a minute, while others require patient research; technical men are more inclined to ask for what will be published to-morrow than what was published last week, so that textbooks are often quite valueless, and reference must be made to the most recent articles in current periodicals. Some research workers are rather secretive, and seem half afraid to let the librarian know what is wanted. Members have open access to the shelves, but the staff are naturally more familiar with the resources of the library. The reference room (in which readers are allowed to smoke) is on the mezzanine floor below, and contains the current issues of some 350 technical periodicals set out in racks for open access. The external loans amount to about

⁵ Dewey (Dr. Melvil), "Decimal Classification and Relative Index: for libraries and personal use in arranging for immediate reference books, pamphlets, clippings, pictures, manuscript notes and other material." Edition 13, revised and enlarged by Dorkas Fellows, editor. 1652 pp. with illus. Forest Press, Lake Placid Club, Essex co., N.Y., 1932.

4000 volumes per annum, one-third of which are sent out in response to postal enquiries. Almost all works are lent out from the library, except those of a reference character such as dictionaries and directories. The time allowed is two weeks; after that period has elapsed, a reminder is sent; and then the book may be replaced at the borrower's expense, if not returned within another week.

The matter of shelf accommodation has presented a serious problem in recent years. British librarians are often apt to be too conservative of old material, which is no doubt partly due to a disinclination to undertake the responsible and difficult work of revision. In libraries whose shelf accommodation is limited, periodical revision is essential for efficient administration; for scientific research, we need an "*instrument de travail, et non pas cimetière d'imprimerie.*" Whereas, in some libraries historical matter is of importance, in others it becomes an encumbrance; some American libraries have a periodical and drastic weed-out. Mr. Stock has compiled a Brief Index to all the papers which have been read before the Institution from the year 1847 up to date; this is revised every two years, and is an admirable piece of work.

LIBRARY of the INSTITUTION OF CIVIL ENGINEERS: Founded in 1818, this is the oldest of our London technical institutions for those who act as "mediators between the Philosopher and the Mechanic." The philosopher searches into nature and discovers her laws and the principles on which she acts; the technical man formulates plans based on those principles, to adapt them for the use of mankind; and the mechanic is instrumental in the realisation of those plans. The

successful "mediator" must have both the theoretical depth of the philosopher, and the practical experience of the mechanic. In 1820, Thomas Telford was invited to take office as first president of the new Institution; he accepted, and at the same time presented a substantial collection of technical books which has formed the nucleus of a valuable library. In 1828, the Institution received its charter of incorporation, for public usefulness defined as direction of the "sources of power in Nature for the use and convenience of man." There are at present about 11,000 members.

The main library is a private one, reserved for their use, and is open from 9.30 a.m. to 5.30 p.m. The collections amount at present to about 60,500 volumes and 17,500 pamphlets devoted to technical science, with particular reference to public works. The annual accessions are to some considerable extent due to "presentations" from members, all of whom are expected, under an old rule, either to read a paper before the Institution, or to make an addition to its library. Recent accessions are exhibited for a certain period on open shelves in the main hall. This occupies the whole of the front façade on the first floor, which is to be extended in the near future. This spacious room would appear to have been intended for an architect to behold, rather than for a librarian to use. Elaborate fire-places decorate both ends. There are seats for about 20 readers, and the room has a comfortable atmosphere. Ladders must, however, be used to reach the upper shelves of the old-fashioned wooden alcove book-cases, around the walls and between the tall windows. These contain about 20,000 text-books, while in the balconies above them is shelved an extensive collection of official research publications from Great Britain and the domi-

nions, as well as the overflow of those from the United States.

There is a printed author index in six volumes up to 1895, with an addenda in which is enumerated the special collection of 270 rare books on watches and clocks. Three supplements take this printed index up to 1915, when the modern card-indexes were started on the standard 5 × 3 in. cards. The periodical accession lists are printed in 15 copies for internal use, but are not published; the references are cut out, and pasted on cards for intercalation in the indexes. As a rule, about 3 to 5 entries (with cross-references) are made for each work. Cards for the subject index (which is separate from that under the authors) have the appropriate catch-word handwritten above the mounted reference. The catch-word classification is an individualistic scheme with about 200 sub-divisions. Each card bears the shelf-mark, which directs readers to the *shelf* on which the volume is to be found, but as there are about 50 volumes on each shelf, and in no definite order, the final location of the desired book often involves a search. The shelf-marks are also written in pencil (to facilitate subsequent alteration) inside the cover of each book. Readers are allowed open access to the reference collections, but are asked to leave their books on the tables after use, and *not* to replace (which would too often mean misplace) them on the shelves. There is also a separate loan collection of about 1600 volumes, enumerated in a list which is issued to members of the Institution; numbers are thus sufficient on the loan requisition forms, and the whole titles of works need not be copied. This department continues to increase, and at the present time some 1620 volumes are lent per annum; most of them are posted to the borrowers. Parts of periodicals

are also lent, if unbound and replaceable. Books of definite technical interest are purchased for addition to the loan collection, in response to special requisitions from members.

The upper balconied store-room contains the transactions of scientific societies, shelved under the respective countries, and then in alphabetical order of their titles; here are also shelved some of the oversize books, and the bound volumes of periodicals. Those which are not of sufficient interest to bind and keep, have their unbound parts placed on open access for six months, and then disposed of as waste paper. Needless to add, these are *presented* periodicals which are disposed of in so drastic a manner. The unbound parts of some 225 technical periodicals (transactions of societies excluded) are placed on open access in two comfortable rooms at street level, each of which has seats for about 20 readers. The current numbers are placed in vertical racks which show up well their title-covers; other recent issues (for the past six months) are laid flat in open horizontal shelves, with the titles on small labels above them. There is also available a collection of technical directories and similar reference works. The collection of rare editions, and most of the older books not in frequent demand, are shelved in a basement store (above flood-level) which is not open to members. When the proposed extensions are effected, an electric book-lift will connect the various floors. For the information service, a current manuscript index of articles in technical periodicals is maintained; the references are written on loose leaves, each of which is headed with the respective catch-word for alphabetical classification. As the periodicals are scanned, and their articles noted on receipt, this index is invaluable as a quick reference tool

for the latest available information. Book-lists are also prepared in response to specific enquiries. The staff consists of three librarians, with the clerical and operative personnel.

LIBRARY of the INSTITUTION OF ELECTRICAL ENGINEERS: This institution was founded in 1871, with Mr. C. W. (later Sir William) Siemens as its first president, in order to promote the advancement of electrical science and its applications, with the help of lectures, exhibitions, publications, and the establishment of library facilities to aid invention and research. The secretarial and council work was at first carried out in offices at Broad Sanctuary, Westminster, and later in Victoria Street. In 1909, the Institution acquired premises of its own on the Victoria Embankment; these were adapted, and to some extent rebuilt, in order to suit the needs of the Institution which has been housed there ever since. A wireless section was established in 1919 to provide opportunities for the discussion of papers. In 1921 the Institution received a royal charter of incorporation. A special section was formed in 1928 for the discussion of papers on electrical meters, instruments and protective devices; and in 1934 there followed another special section for transmission and distribution lines. The membership of the Institution has steadily increased to about 15,700 at the present time, and includes almost every man of prominence in British electrical work. The fine wood-panelled lecture theatre (decorated with portraits of electrical pioneers such as Faraday, Wheatstone and Volta) will seat 430 persons, and is provided with all facilities for demonstrations.

At the head of a fine marble staircase, there is a small

historical museum of electrical science, from which the library on the first floor is entered. This spacious hall provides ample accommodation for readers; the front wall contains a number of alcoves, and deep windows which overlook the river Thames, while the other three are lined with handsome adjustable wooden bookshelves, and have a continuous run of balconies around them. The floor is covered with polished cork, which helps for silence. There is excellent diffused illumination (which consumes about 5 kilowatts), and separate table lamps are also provided for readers in the winter months. The collections amount at present to rather more than 20,000 volumes and 30,000 pamphlets devoted to electrical science. In 1916, a number of friends and admirers of the late Dr. Silvanus Thompson purchased his valuable collection (about 4500 volumes and 8000 pamphlets), and presented it to the library as a memorial to him. Special treasures include a number of valuable Faraday manuscripts. Most of the collections are shelved in the main hall, and the remainder (such as the back numbers of periodicals not in frequent demand) in two basement stores; the rate of accessions to the reference department is about 350 volumes per annum. More than 150 current periodicals are received, and most of them are placed in vertical racks for open access; the recent accessions and standard reference works are also at the immediate disposal of readers. About 7000 visitors are received in the course of a year; the fact that some 500 of these readers are not members of the Institution, shows that the library (a private one) is not restrictive in its usefulness. An introduction to the librarian, Mr. J. Corthesy, obtains the same courteous attention and help (even for outsiders such as the writer) which he renders to members.

For the benefit of those unable to visit the Institution, a circulation department has been established. This contains at present about 1750 volumes, confined to British and American text-books and duplicates of the principal works of reference on electrical science; a printed list of this collection (with author and subject indexes) has been issued to members. No periodicals are allowed out on loan. Records of circulation show that some 3150 books are lent (to about 1250 readers) per annum. The author card-index is compiled with the help of entries taken from the printed list of accessions, which appears each month in the Journal of the Institution. It should be mentioned that with this Journal, the Institution makes an important contribution to electrical literature. The entries are cut out and pasted, each on a standard 5 × 3 in. card, and adequate cross-references are added. For the subject index, which is kept separate from the above, an alphabetical scheme of catch-words is used, on similar lines to that of Science Abstracts B, which are edited in collaboration with the Institution. Books in the main collection are shelved in "alphabetical" subject order, which, of course, becomes systematic in the sub-divisions, where we find, for example: *Lamps, electric, arc* and *Lamps, electric, incandescent*. Shelf-marks are written on the author cards. Readers have open access to the shelves, but rare or otherwise valuable works are reserved. About 15 per cent of the books are German, which sometimes contain material not dealt with in British works; French publications amount to about 5 per cent. Books of the circulation department are shelved in simple alphabetical order under the authors; those on wireless communication are, however, shelved in a separate series. One drawback to this library is the noise from

tramcars on the Victoria Embankment; and another (but this depends upon the point of view) is that Mr. Cortesey and his two assistants have no separate offices, but are accommodated in the alcoves mentioned above. This is more convenient for readers in need of helpful advice, than for the unfortunate librarians themselves.

PATENT OFFICE LIBRARY: The free library of H.M. Patent Office was founded in 1855 for the help of inventors, to enable them to avoid a waste of time and expenditure on work which has been done before. Its use is not restricted to those who have business with the Patent Office, but its prime *raison d'être* still determines the book selection. This is confined to technical science, with particular reference to patent and trade-mark literature; the natural sciences and medicine are for the most part excluded. Of the British patent material, the library contains the full specifications with their useful indexes and abstracts. The official series is, however, not at all complete; it contains none prior to 1617, no Commonwealth patents, and has deficiencies even in the period which it covers. These have now been filled, as the result of exhaustive research carried out at the Record Office, and the library now claims to have a complete record of British patents from the earliest in 1449 down to the present time. Since published matter is never out-of-date where patent work is concerned, a special feature is made of old scientific and technical books.

The collections contain at present about 275,000 volumes (exclusive of duplicates), to which are added some 7500 each year. About 3500 current technical periodicals are received. The main hall of the library contains about one half of the collections shelved in

subject order for open access. The adjustable steel book-stacks are so disposed in three tiers (at floor level and on two upper balconies) as to form about 60 alcoves on either side of the spacious central well, which receives natural illumination from the transparent roof. These rather secluded alcoves (in most of which there are tables for readers), with unrestricted open access for the public, have been responsible for cases of mutilation to the books ; but so few indeed, that we have no need to lose faith in our honest London public. The library is open from 10 a.m. to 9 p.m. on weekdays, and records show that about 133,000 readers make use of its facilities in the course of a year. The rules for compilation of the author index differ from those of the British Museum, in that the periodical publications of corporate bodies are entered under their titles, and not under the place-names. The author index was first printed in 1910, with annual supplements (printed in 25 copies for internal use) which have been pasted into a cumulative volume index up to 1930. Since that date, references of new accessions have been printed each week in the Journal, then cut out and pasted each on a standard 5×3 in. card for intercalation into the cumulative author index. Cross-reference data are written above the pasted entries on the cards ; and cards for continuations not referenced in the Journal, are entered in manuscript form.

The subject-matter index is of systematic form, for which a unique classification scheme is used. This consists of two letters for the main classes, which are then sub-divided with numerals used as decimals. About half the index was printed between the years 1909 and 1919 in the form of sectional Guides, which also constituted alphabetical catch-word indexes to the classification scheme. From 1927 onwards, the

subject-matter index has been maintained on standard 5×3 in. cards, with the shelf marks in the upper left-hand corner ; works (such as parts of series) which, for some reason, are not to be found under their subject on the stacks, have their shelf-mark written in red ink. A complete alphabetical catch-word index to the classification (i.e. to the relevant shelf-mark) is now available on standard cards. The complete shelf-list of the collections is at present only available in manuscript form for internal staff use. This is on blue paper slips (quarter foolscap size) kept in envelopes, and is available to readers under supervision. It is possible that a complete subject-matter index will be printed from these slips at a future date. The shelf-mark consists of the subject classification and the last three numerals of the date ; after that, the works are shelved in alphabetical order. The current numbers of all periodicals (about 3500 are received) are placed in box-files for open access until the end of each year, when the volumes are bound and shelved, either in the main hall or in the basement store. The volumes are sent to H.M. Stationery Office to be bound. A separate alphabetical title-index of periodicals is maintained on standard cards. There are also special card-indexes of trade names, and trade publications.

Most of the patent literature from all parts of the world where such records are published (whether in the form of full specifications, abstracts or mere lists), is presented in return for the British material. It is estimated that some 200,000 patents are issued each year ; most of the important countries publish, in addition to full specifications, adequate name and subject indexes which facilitate searches. For those countries which print class allotment marks on their specifications

(France, Germany, Holland, Switzerland, Austria and Scandinavia), the library is able to shelve duplicate sets in class order. These classified copies are kept with a check list in manila envelopes on the third balcony, and can be consulted by readers on demand. Those in simple numerical order are bound and shelved for open access on the second balcony. For the British patents, a special classification is used, which is quite distinct from that described above for the main collections. A useful adjunct to the library service is the photostat equipment which enables facsimile reproductions to be readily made of articles in periodicals, patent specifications, and so forth. Since no external loans are allowed, this service is of help to those who are unable to come and consult the work itself, or who require copies for their own files. The staff and operative personnel number 26 under the librarian, Mr. Allan Gomme, to whom the writer's sincere thanks are due for valuable information and help in the preparation of this section.

BRITISH LIBRARY OF POLITICAL AND ECONOMIC SCIENCE: Founded in 1896, this library now functions under the London School of Economics and Political Science, which forms part of the University of London. It is not open to the public, but only to students of the School, and certain other approved readers (such as university professors and lecturers, or those occupied in public administration) to whom library permits are issued at prescribed fees, or free in other limited cases. The library is thus called upon to provide both the prescribed needs of the students, and material for more advanced readers. The students, however, outnumber all other readers, and the open shelves with more than 100,000 volumes are so planned to follow closely the

educational scheme of the School. The student is provided with all that he requires for his course work and private studies parallel with the lectures he attends. The second function of the library demands the accumulation of material to serve as a vast reservoir of facts for the independent or more advanced research worker. The reserve stacks provide accommodation for the official publications of almost all countries, with some 200,000 pamphlets and leaflets, and a collection of manuscripts.

The library consists of a number of connected rooms, each devoted to a particular subject, and indicated with a letter of the alphabet. Each room contains the *bound* volumes of its more important relevant periodicals; while rooms L and S, which are devoted to law and statistics, contain in addition their current (unbound) numbers. In all other cases, the current numbers of periodicals (with some of the recent unbound parts) are shelved in room P, where the more important are laid out on inclined shelves for open access. The titles are in alphabetical order, with a letter added after each (in round brackets) to indicate in which room the bound run of the periodical is shelved. In all, more than 400 periodicals are received. The entrance to the library (where all attaché-cases must be left) is at street level at the far end of the main corridor of the School. A janitor is appointed to check the tickets of readers, and to examine all books carried out of the library. There is also a desk with an assistant to deal with enquiries; those of an intricate nature are referred to the "readers' adviser" whose function is the same as that in most American libraries. Further on, we come to the book counter where all enquiries for material from the reserve stacks R should be addressed, and where all

books lent out on voucher are checked. This counter also forms the main control station for the automatic book conveyor, and an electric book-lift which communicates with a separate research room on the second floor.

Room Z, which is just inside the entrance, contains the author card-index in more than 150 drawers, duplicate copies of the five volumes which form the printed subject-matter index, and the card-index supplement to the same. In the alphabetical author card-index, entries are also made under the names of editors, the titles of anonymous works, and under the names of societies, institutions or other responsible bodies for works published under their auspices. Abundant cross-references are supplied to cover all possible cases of doubt. Each card provides the reader with all the information he requires to find or obtain the work; the location data consist of the letter which corresponds with the room in which the work is shelved, its classification and accession numbers.

The subject-matter index is in four volumes up to 1929, with a printed supplement for 1929-1931. From the year 1929, however, the library has also maintained a subject-matter index in card form; this contains not only the cards for all works listed in the printed supplement (1929-1931), but also cards for all works acquired since. It is kept up-to-date with the daily insertion of cards for all new works received in the library. Books on the open shelves of every room are in subject order; for this purpose, each subject is denoted with a combination of letters and numerals based on an American classification scheme. In this, the first letter denotes the broad subject class, the second letter denotes its main sub-division, which the subsequent numerals

enable to be still further sub-divided. For example : H *Social sciences*, HE *Transport and communication*, HE 9911 *Aeronautics*. In addition, however, the books on a particular subject are further sub-divided in accordance with their respective countries, with the addition of a number in round brackets after the main classification. This additional number is taken from the Dewey decimal classification ;⁵ the first cipher represents a continent, the second a country, and the third (if necessary) a smaller administrative sub-division within that country. For example : HE 9911 (7) *Aeronautics in North America*, HE 9911 (73) *Aeronautics in the United States*. All books with the same subject classification and country numbers are shelved in strict alphabetical order under the names of their authors. Since a book misplaced is virtually lost, readers are asked *not* to replace works on the open shelves, but to leave them for the trained staff to replace.

In addition to the main library, there are a number of "seminar libraries" attached to the different departments within the School, which contain special duplicate collections of works for the use of honours students within each department. The books in these reserve collections are entered on buff-coloured cards in the main author card-index. External loans are restricted to students of the School, and to certain works (such as the more important text-books) which are set apart for the purpose. A separate index of this loan collection is maintained, and its books are also entered on special coloured cards in the main author card-index. For the special use of research students, a number of small studies are available, each of which contains a small stack of book-shelves and a locker. Requisitions can be sent down to the book counter in the automatic

book-lift, which also delivers them after an interval of some few minutes. In addition, there is another room to seat about 50 readers, with more than 100 lockers reserved for the use of research students; the lockers are private, but no desk accommodation can be reserved in this room. On the second floor, there is also a comfortable research study in which readers are allowed to smoke; this has an electric book-lift in which requisitions can be sent down to the book counter, and the works in due course delivered. The library has its own book-binders' shop, and photostat department in which copies of statistical tables, charts, or articles in periodicals can be made at nominal fees. There is also a cinéscopic camera and projector; the camera is used to take films of printed matter, manuscripts or maps, which can be studied later with the help of the projector. This equipment can also be used as an alternative to the epidiascope. As a further service to research workers, books are now borrowed on their behalf from other libraries. If the desired work cannot be found in the card-index, a request for inter-library loan should be made at the book counter, so that an application can be issued to the National Central Library, under whose auspices this admirable service is maintained.

CHAPTER III

SCIENTIFIC DOCUMENTATION IN PARIS

WHEN we contemplate the well-planned boulevards which radiate from the *Arc de Triomphe*, in particular that superb prospect down the *Champs Élysées* to the Louvre, or when we travel on the *Métro* and find the directions so explicit that there is no need to "ask a policeman," then in both cases our appreciation of Paris is due, I think, in no small measure to a sense of *method*. Now since this municipal characteristic of Paris is but an expression of the mental characteristic of its people, and since method is an essential of librarianship, we can therefore deduce (even before we meet them) that Parisian librarians must be as admirable as their town.

What impressed me perhaps most of all in Paris, was a well developed co-ordination between the various libraries (scientific or otherwise), thanks to the activities of the UFOD, the French Union of Documentation Centres.⁶ As a concrete example of this co-ordination, I would mention a classified and annotated list of the

⁶ This term "documentation" is well understood in France, but often requires a little explanation in our own country. It is not a disease, as was first supposed here, when the *Institut International de Documentation* adopted the word for their new title in 1932. To clear our minds on the subject, we cannot do better than quote the official definitions of the UFOD, which run as follows:

DOCUMENT: Toute base de connaissance, fixée matériellement, susceptible d'être utilisée pour consultation, étude ou preuve. Exemples: manuscrits, imprimés, etc.

DOCUMENTATION: Établissement, recherche, réunion et utilisation des documents.

Parisian libraries which I saw, posted on a notice board for information of the public, in the entrance hall of the *Bibliothèque Nationale*; she reminds one of an old *mère de famille* with her children . . . old, but not old-fashioned, as we shall see in the notes which follow.

BIBLIOTHÈQUE NATIONALE: This national library occupies in France a similar function to that of our British Museum Library in London. Of considerable historical interest, it is in the line of direct descent from the private libraries housed in the *châteaux* of the French nobles, most of whom were keen book-lovers. The libraries of the monasteries suppressed under the Revolution also enriched its collections, which were transferred to the present site in the rue de Richelieu in the year 1721. The *Bibliothèque Nationale*, formerly known under the names of "Bibliothèque Royale" and "Bibliothèque Impériale," now ranks with our British Museum as one of the most important libraries in the Old World, and contains at present more than four million volumes.⁷ It comprises four distinct departments: (i) Printed books and maps, (ii) Manuscripts and documents, (iii) Prints, and (iv) Medals, coins and antiques. The first of these departments (printed books) is of course the most important. In accordance with a decree of 1793, every printer in France must deposit in the library copies of all books, pamphlets or newspapers which he publishes. In addition, a considerable amount of selected literature is acquired from abroad, either as

⁷ The Lenin Public Library (which I visited in Moscow last summer) contains about five million volumes, but many of them are duplicates. Thus it is richer in material rather than intellectual content. See p. 124, also: Spratt (H. Philip), "Notes sur quelques Bibliothèques scientifiques et techniques en Europe du Nord." *La Documentation en France*, 4^{ème} Année, No. 1 (Janvier 1935), p. 10. Union Française des Organismes de Documentation Paris.

purchases or presentations. This selection of literature to be acquired is carried out on similar lines to those of the Science Museum Library, and based on (a) readers' requisitions, and (b) a survey of current publications, as described in our first chapter. The readers' room (*Salle de Travail des Imprimés*) is a fine hall with accommodation for about 350 readers, and is open from 9 a.m. to 6 p.m. The would-be reader must first obtain a ticket from the director, on which is stated the subject to be studied. At the entrance he receives a *bulletin personnel* on which he writes his name and address. Requisitions for books are made on forms which are handed to an assistant. When the reader returns the books, his *bulletin personnel* is returned to him, and must be handed back to the door-keeper at the exit. At the farther end of the hall, behind a barricade of card cabinets, a semi-circular sanctum accommodates the librarians. The index to which readers have access, consists of modern loose-leaf files, into which new entries can be intercalated with ease in their correct alphabetical order. Some of the old-fashioned volumes, in which new slips had to be bound with cord each time (a tedious procedure), still remain, however, but are in due course to be superseded. Some of the cards in the index cabinets are much narrower than the international standard size (125 mm. \times 75 mm.), so that references cut from published documentation services could not be pasted on them. Moreover, I was sorry to see their use of the word "Londres" instead of London; just as German visitors must be irritated at our use of the word "Munich" instead of München.

With reference to subject-matter classification, a system based on the letters of the alphabet is used. As there are, of course, not sufficient letters for adequate sub-division, numeral suffixes have to be added; and

in the classification of the chemical literature, for example, the system becomes such a complex mass of letters and numerals intermixed, as to be a torture to the librarians, and an effective barrier between the uninitiated would-be reader and the literature he seeks. As a contrast, it is pleasant to contemplate the *Classification Décimale Universelle*, which in the Science Museum Library, for example, has proved itself an inestimable help to classifiers and readers alike, and enabled the subject-matter index to be built up with international co-operation. The central book-store is of monstrous size, and two additional stories are soon to be built above the present level of the roof, in order to accommodate future accessions. No artificial illumination is installed, for fear of fire; when and where the sun's rays do not suffice, the staff have to use electric hand-lamps.

Perhaps the most important (so far as readers are concerned) of the many innovations which have recently been carried out in the historic *Bibliothèque Nationale*, is the co-ordination of all the indexes and reference works which had hitherto been scattered around the main *Salle de Travail*. These have been supplemented by one of the most comprehensive collections of documentation repertoires in existence, and systematically set out for simpler and more convenient consultation, both by the novice and the experienced *habitué* of the *Bibliothèque Nationale*. Some idea of the work involved can be formed, when one considers that the *Bibliothèque* contains more than four million volumes on more than 100 kilometres (65 miles) of shelves.⁸ As there was not sufficient space available for this new service in the already overcrowded *Salle de Travail*, it has been accom-

⁸ Bulletin des Bibliothèques, No. 6 (Avril-Juin, 1934), p. 24. Société des Amis de la Bibliothèque Nationale, Paris.

modated in a small annex,⁹ opened to the public in April, 1934. A double marble staircase leads down from the *Salle de Travail* into this basement, which runs for about 30 metres (100 feet) parallel with the rue de Richelieu. It is at present about 5 metres (16 feet) wide, but will be extended in the near future. It is well illuminated and ventilated, and (as usual in Paris) rather too well heated; double windows obviate the penetration of noise from the street. The card-indexes of the *Département des Imprimés* decorate its walls, as well as a coloured location chart for the benefit of readers "*qui ont la tête dure*." A small volume compiled by Madame S. Briet, the directrice of this department, serves to initiate readers into its system, and also contains concise explanations of how to find the *cote* (press-mark) of a book or periodical (which must be specified on all requisitions) and the literature on any special subject, and how to fill in the requisition forms.

There are, in all, twenty-two repertoires, of which the alphabetical indexes to author and anonymous works in the *Bibliothèque Nationale* form the most important items. These have been printed and bound for all works received prior to 1894; in addition, there are two supplements in loose-leaf form: (a) for the years 1894 to 1925, and (b) from 1925 to the present. For that part of the alphabetical index M to Z which has not yet been printed, bound photostatic copies of the old manuscript index cards are available, 32 cards on each sheet. The alphabetical subject-matter indexes of the *Bibliothèque Nationale* are also very important for readers who seek the available literature on a certain subject; these are in loose-leaf form, mounted in binders. The

⁹ Briet (Madame S.), "La nouvelle salle des catalogues à la Bibliothèque Nationale." *Revue du Livre*, Deuxième année, No. 7 (Mai, 1934), pp. 170-173.

"methodic" index, however, has already been printed. There are also printed indexes of special exhibitions, such as "Musique ancienne de la Bibliothèque Nationale," and of numerous other important French libraries, in Paris and the provinces. In addition, we find a comprehensive index of journals and periodicals whether published in France or abroad; the French are in loose-leaf form, and the others represented by a collection of printed lists such as the "Index to Periodical Literature," the "Dansk Tidsskrift-Index" and so forth. Various national indexes, such as the "Deutsches Bücherverzeichnis" and the "Publishers' Circular" are available, as well as those of important libraries abroad, the British Museum and the *Preussische Staatsbibliothek* for example. General works of reference and documentation include: the "Minerva Jahrbuch," the "Index Generalis," and the manual of the *Classification Décimale Universelle*.

All the bookshelves are provided with ample desk accommodation at elbow level, so that readers may stand and consult the heavier volumes in comfort; in addition, there are tables with about twenty seats for readers. The provision of these comfortable conditions has resulted in a marked improvement of readers' requisition forms, which are now better written than formerly in the main *Salle de Travail*, and contain the precise information *comme il faut*. Pneumatic tubes, of which this new service forms the departure terminus, whisk away readers' requisitions to the book-stores; and introduce a touch of the ultra-modern¹⁰ into this historic *Bibliothèque Nationale*.

¹⁰ Briet (Madame S.), "Du nouveau à la Bibliothèque Nationale." Bulletin du Bibliophile et du Bibliothécaire, 20 Mai, 1934, pp. 210-213.

ARCHIVES NATIONALES : The national Record Office of France was founded in 1795, and has been housed since 1808 in the ancient *Hôtel de Soubise*, built by the architect Delamair in 1706-12. It is centrally situated in the rue des Archives, about 15 minutes' walk eastward from the *Bibliothèque Nationale*. The main entrance leads into the spacious *Cour d'Honneur*, which is surrounded by a splendid colonnade, and has sculptures by Robert Le Lorrain on the façade. The main store-rooms for the documents were added in the nineteenth century, and are decorative rather than practical. The wooden shelves are liberally spaced, and take up about three or four times as much floor-area as is usual in modern library practice. As the air is not specially conditioned, these old wooden shelves, which absorb atmospheric humidity, are said to be better than steel for preservation of the documents. These are stored in stout cardboard boxes, marked on the outside for reference ; the number of documents in the Archives is well over 600,000. The nineteenth century store-rooms have not been wired for electric illumination for fear of fire, but this prohibition has not been enforced in the new extensions which are also provided with electric book-lifts. The modern store-rooms, which I saw in course of reconstruction, are of reinforced concrete ; these skeletons contained as yet no intermediate floors, which are to be of steel and supported on the steelwork of the shelves themselves. In contrast to this ultra-modern construction, the ancient exterior of decorative masonry has been retained, in order to harmonise with the architectural ensemble. The old-fashioned but spacious *Salle de Travail* is open to readers daily from 10 a.m. to 5 p.m. No documents are, as a rule, made available to the public until after an interval of 50 years, so that all

persons mentioned therein can reasonably be expected to have died in the meantime.

The chief treasures of the Record Office are, however, to be found in the museum (*Musée des Archives*); this unique collection of historical documents and relics occupies seven rooms on the first floor. In the vestibule are impressions from the seals of the old French emperors; the decorative staircase also contains further impressions of feudal and official seals. The rooms on the first floor still retain their ancient aspect, and are decorated with historical pictures and Gobelins tapestries. The collections are of the first importance to students of French history; and, in addition to the documents (of scientific interest, there is a letter of Parmentier on the cultivation of the potato), include a model of the old Bastille fortress (made in 1790), the inevitable bust of Napoléon, and numerous military banners, relics of the Republican armies, coins and medals.

BIBLIOTHÈQUE du CONSERVATOIRE NATIONAL DES ARTS ET MÉTIERS: The *Conservatoire*, founded shortly after the French Revolution, has occupied since 1798 the church, cloisters, refectory and other premises of the ancient priory Saint-Martin-des-Champs, which was founded by Henri I in 1060. It is the so-called "Science Museum" of Paris, and its library is therefore the counterpart of the Science Museum Library in London. The *Bibliothèque* is housed in the ancient *réfectoire* of the priory which now forms the *Salle de Lecture*, and which P. de La Force, in his *Description de Paris*, considers "est ce qui existe de plus parfait dans le Gothique"; it is indeed rare to find a modern library of technical science housed in "une salle dont la beauté architecturale élève l'esprit vers la haute méditation intellectuelle." The

hall measures 140 feet internally, and is divided by seven central columns of remarkable boldness which support the lofty Gothic vaults ; these are now shown up with beautiful effect by a modern system of illumination which was installed in March, 1932. The tables, with accommodation for more than 100 readers, are provided with efficient indirect illumination.

Situated in the centre of Paris, not far from the *Bibliothèque Nationale*, this important library of technical science and industry is open to the public all weekdays from 10 a.m. to 10 p.m., and even on Sundays from 10 a.m. to 3 p.m. It is accessible without formality to students, research workers, inventors and all interested in technical science. The activities of the library have steadily increased since 1920 ; it now contains more than 100,000 volumes (with many rare and precious manuscripts and early prints on the history of science), and receives 300 current technical periodicals. There is a card-index to all the literature, with author and subject-matter entries in the same alphabetical series, after the American fashion. Since 1919, the Conservatoire has also established an *Office de documentation scientifique et industrielle*, to abstract and index all French periodicals received in the library, and to provide a current documentation service for the public in the form of a dictionary card-index. Decimal classification has, however, not yet been adopted. Monsieur E.-M. Lévy, the librarian, considers that a modern library should be rather an "instrument de travail, et non pas cimetière d'imprimerie."

MAISON DE LA CHIMIE : A recent development, of international importance, is the new world centre of documentation for chemical literature which has been

established in the *Maison de la Chimie*. This institution, opened in October, 1934, to commemorate the French pioneer chemist, Marcelin Berthelot, is a splendid achievement of scientific co-ordination, and forms the nucleus of the projected "Cité des Sciences" in Paris. Its conception dates back to the year 1927, the centenary of the birth of Marcelin Berthelot, when a special joint committee of the *Société Chimique de France* and the *Société de Chimie Industrielle* decided to open an international subscription toward the creation of a central *Maison de la Chimie*, which should co-ordinate the work of all chemical and pharmaceutical societies in Paris, conserve all past records of chemical research, and act as an international centre of documentation for chemical literature. The funds rose to 25 million francs, of which 13 million were collected in France; the French Government, moreover, donated an ancient *château* (1734) in the rue Saint-Dominique, near the *Chambre des Députés*. This historical mansion has been restored, and two new blocks have been added, one on either side; their exterior matches so well the restored central block that, even after a period of 200 years, the completed *Maison de la Chimie* now forms a harmonious architectural ensemble. The central block, the old-world interior of which has been preserved and decorated with portraits of pioneer chemists, forms an ideal suite of reception rooms. The new western block, known as the "Centre Marcelin Berthelot," provides adequate accommodation for various chemical societies, committee and conference rooms, lecture and exhibition halls; and contains a luxuriously furnished banquet hall to seat about 500, with inlaid wooden dance floor of 600 sq. metres (6450 sq. feet) area, and a theatre to accommodate comfortably an audience of nearly one thousand, decorated with

taste, and fully equipped for dramatic or operatic performances and sound-film projection.

The library and documentation centre¹¹ for chemical literature is located in the new eastern block, which also accommodates the administrative offices; it is quite evident that no expense has been spared to obtain the most modern and efficient mechanical equipment, such as "Adrex" machines. This new library combines the collections of the *Société Chimique de France* and the *Société de Chimie Industrielle*, which formerly were devoted to pure and applied chemistry respectively, and therefore now supplement each other most effectively in the *Maison de la Chimie*. The surplus available funds, due to this co-ordination and resultant elimination of former duplication, have been utilised to increase the number of chemical periodicals acquired for documentation purposes, which now number more than 600. The library contains at present about 100,000 volumes on chemistry and related subjects. The card-index for the use of readers is mounted on a series of vertically pivoted frames (to be seen in the frontispiece), the backs of which have vertical stripes of various colours; each card has one or more holes punched in positions to show these colours for the purpose of a broad classification. There are seats for 40 readers, each provided with an electric button to summon an attendant; the illumination is entirely indirect. Of the more important periodicals, about 460 are set out in vertical racks, above the tops of which their titles alone are visible; a bench at elbow level is convenient for preliminary consultation of a

¹¹ Hauzeur (Louis), "Le Centre de Documentation Chimique." *Chimie et Industrie*, Numéro spécial, octobre, 1934, p. 15. *Société de Chimie Industrielle*, Paris. See also: Spratt (H. Philip), "Chemical Research and Documentation in Paris." *Chemistry and Industry*, vol. 54, No. 19 (8 March, 1935), p. 214. Society of Chemical Industry, London.

volume. Photostatic copies of articles can be prepared at short notice on the premises. The bookstores are in seven stories of fireproof reinforced concrete construction; the intermediate steel floors are supported on the shelves themselves. All books are shelved in five different sizes in order of accession number, the simplest and most economical method; there is an automatic electric book-lift.

At the time of my visit, the documentation service (*Centre de Documentation chimique*) was not yet in full operation; but it promises to be, in the near future, one of the most efficient in existence for chemical literature, which covers an immense field. Abstracts from more than 600 current periodicals are to be published each week. The cards on which these abstracts are printed must, of course, exceed the library standard of 125×75 mm. for index cards; in fact, the journal "Chimie et Industrie" is exactly four times their size. When filed in their cabinets, these abstract cards overlap on the "Kardex" principle, so that the title and reference to each article abstracted (*i.e.*, the first two or three lines) alone remain visible. Each drawer of cards therefore presents, at first inspection, an index of the abstracts; these can then be readily uncovered for further examination. These abstract cards, distributed each week to subscribers, keep them well informed of the latest developments in modern research, and enable each to build up a current card-index of literature on his own specialised branch of chemical work. Below the library is a lecture theatre for chemical demonstrations, to seat about two hundred, well equipped with projection screens and electrically operated movable blackboards. In order not to waste the time of the audience, the experiments can be prepared beforehand in two ante-

rooms on either side ; the tables are then run on rails to the lecturer's platform. If desirable, experiments can be made behind a stout window which would shield the audience in the event of an explosion. The chairs in this hall are turnable, which is a convenience when members of the audience take part in discussions.

BIBLIOTHÈQUE de la SOCIÉTÉ DES INGÉNIEURS CIVILS DE FRANCE : The word "civil" has a much broader technical application in France, and this library is, therefore, not so restricted in scope as its name would perhaps lead one to suppose. It embraces, in fact, the whole of technical science, and is one of the most important and efficient libraries of its kind in Paris. Centrally situated near the Gare St. Lazare, it has been steadily built up by the *Société* over a period of 37 years, contains at present more than 90,000 volumes, and receives about 500 current technical periodicals. It is intended primarily for members of the *Société* (who number 6000), and is open on weekdays from 9 a.m. to noon, and from 2 to 5 p.m. In the author-index, the publications of institutions and societies are entered directly under their titles (not under the town-names); the subject-matter index is partly systematic and partly alphabetical, with adequate cross-references. Decimal classification has not yet been adopted. There is also a separate list of the relatively recent acquisitions, compiled since 1925 with annotated references cut out from the *Procès-verbal* of the *Société*, and pasted by order of accession number in separate binders by subject-matter. The current issues of the more important periodicals are placed at the immediate disposal of readers, who are not as a rule allowed direct access to the shelves. Volumes are shelved in four sizes by accession number, and are therefore easily located. Lack

of adequate space has, however, rendered it necessary to place the smaller volumes two-deep (and in some cases even three-deep) on the shelves. The location and disinterment of volumes entombed in the third rows can hardly be a more formidable task than their subsequent replacement. Books are not allowed out of the library on loan, and lack of adequate staff also prevents the maintenance of any extensive documentation service.

BIBLIOTHÈQUE de l'ÉCOLE SUPÉRIEURE D'ÉLECTRICITÉ, MALAKOFF (near PARIS): This technical school for electricians is a foundation of the *Société Française des Électriciens*, and quite independent from the *Université*. It occupies modern and spacious premises at Malakoff, a southern suburb of Paris, and is easily reached by the *Métropolitain* railway. On the first floor is the *Bibliothèque* with its very specialised documentation service. The librarian, Colonel F. Doizan, uses the decimal classification, adapted to his particular requirements. The main class-number 621.3 for electro-technique, has been adopted in accordance with the Brussels system; this comprises the whole scope of the library, which is further sub-divided (and very minutely) in accordance with a special decimal scheme¹² published by the *Société Française des Électriciens* (more than 100 copies of which have already been sold). It would be irrelevant to compare this scheme in detail with the *Classification Décimale Universelle* (of which one cannot help but consider it as a corruption); the inevitable drawback is that such "home-made" classification schemes do not facilitate direct co-operation with other libraries, a factor which is of such vital importance in scientific documenta-

¹² Documentation Électricité et Électrotechnique, Classification F.D. Société Française des Électriciens, 8 avenue Pierre Larousse, Malakoff (Seine), 1931.

tion. Nevertheless, it cannot be denied that, at least so far as his internal purposes are concerned, Colonel Doizan has built up a very efficient documentation service. Of the 300 current periodicals received in the library (all of which are more or less devoted to electrical subjects), nearly all the important articles are abstracted. This work is carried out by an expert staff of 20 technical translators and abstractors. Standard cards are used, on which are written: the name of the author, the title of the article in the vernacular and in French, a full reference to the journal in which it appears, an abstract of about ten lines (in French), and the decimal classification number. This last named really consists of two numbers: the broad division 621.3 in accordance with the Brussels system,¹³ and the special "home-made" sub-division written separately underneath. These classified abstracts, which constitute a comprehensive current documentation of electrical science, are issued as a periodical publication. For internal use in the library, the cards are filed in decimal order; when the bunch of cards under one particular decimal classification number becomes too unwieldy for rapid subject-matter selection, the section is further subdivided. This empirical method of sub-division results in a more or less even distribution of the literature.

It is lamentable, however, that this important subject-matter index of abstracts, with already more than 200,000 cards, should have been based, *not* on the *Classification Décimale Universelle*, but on an individualistic corruption, impossible of co-operative utilisation without laborious concordance. And the drawback cuts both

¹³ Classification Décimale Universelle. Publication No. 151 de l'Institut International de Documentation. Comprend plus de 60,000 subdivisions ainsi qu'un index alphabétique, imprimées en deux colonnes, 4 volumes, 2153 pp., quarto. Adresse; rue Piers 101, Bruxelles. Prix: Frs. Suisses 50.00.

ways, since of all published documentation services received in this library, none of their valuable references can be intercalated into its card-index until specially re-classified to suit the non-standard system. Periodical literature for its documentation service forms the bulk of the library's accessions, since developments in electrical science are so rapid that when a text-book has been written, printed and published, it is almost inevitably a year or two out-of-date. This collection of specialised technical periodicals is, however, exceptionally comprehensive; there is, for example, a set of the *Revue d'Électricité* complete from the first number, which is very rare. The main hall of the library is spacious, and contains seats for about 50 readers. All works must be consulted on the premises; there are no facilities for external loans, but photostat copies can be supplied within 24 hours, also expert technical translations with a minimum of delay on request. The total number of technical students in the *École* amounts at present to about 300, of which about one hundred are specialised on wireless telephony; the *Laboratoire Central d'Électricité*, which forms part of the institution, is one of the most important laboratories for electrical research in France.

BIBLIOTHÈQUE de la CHAMBRE DE COMMERCE: This important specialised library and centre of documentation for commerce, economics and finance, is situated in the avenue Friedland, near the *Arc de Triomphe*. The collections at present contain about 80,000 volumes, which are shelved in order of accession number, in five different sizes. The alphabetical author index consists of a printed volume with four supplements, continued as a card-index which will also be printed and bound in

due course. The subject-matter classification is subdivided with capital letters, Roman numerals, and then small letters ; a rather complicated system, which may perhaps be superseded later by the *Classification Décimale Universelle*. The library issues each month a printed list of accessions, the references in which are cut up and mounted on cards for the author and subject-matter indexes. A modern "Kardex" cabinet facilitates a constant check of the due arrival of current periodicals, more than 1500 of which are received. Their more important articles are abstracted and classified in the library ; this current documentation service is published with more than 750 abstracts each month. The main hall of the library, which is open free to the public, has seats for 35 readers ; it is comfortably furnished, and a thick carpet on the floor helps to maintain silence.

BIBLIOTHÈQUE de l'INSTITUT SCIENTIFIQUE DE RECHERCHES ÉCONOMIQUES ET SOCIALES : This new Institute commenced its activities as a Rockefeller foundation in October, 1933, and is now housed in new premises in the rue Michelet. Its objects are: to further scientific methods in the study of economic and social phenomena, to collect and analyse all available information on these subjects, to publish the resultant statistics and conclusions in collaboration with similar institutions in France and abroad, to establish and place at the disposal of the public comprehensive archives of the financial and economic reports of the more important commercial and industrial enterprises, and to aid students in the scientific pursuit of economic research. The staff consists of the director, Monsieur Henri Lemaître, three technical collaborators, two assistant-librarians, and the necessary administrative personnel ; a total of eleven.

The documentation centre¹⁴ can be considered in two sections : (i) the library of reference works and current periodicals necessary for the researches carried out in the Institute, and (ii) the collection of companies' financial and economic reports. The card-index of this new library (built up since the commencement of 1934) already contains more than 10,000 entries on the standard 125 × 75 mm. cards ; these are filed in accordance with the American "dictionary" method : author-names, titles and subject-matter catch-words, all in the same alphabetical series. Cross-references are written on the backs of the cards. The reference collections, which are in continual use, have been further classified in accordance with a methodical scheme based on that used in the statistical department of the *Faculté de Droit*, for the classification of articles abstracted in the periodical "Documentation économique." This scheme has 15 main lettered classes, sub-divided with numerals used as decimals ; for example, F.25 *Les systèmes économiques (capitalisme, socialisme, fascisme)* would come before the third sub-division F.3 *La politique économique*.

For quick reference, an alphabetical "Kardex" list of periodicals is mounted on the wall, where I also noticed a special map of the 23 important libraries of economics and political science in Paris. There was in course of compilation a union-list of economic periodicals in the Parisian libraries ; this was in card-index form, with cards of different colours to differentiate readily the various libraries. The documentation service of the *Société de Statistiques Économiques et Financières* was filed

¹⁴ Rapport sur l'Exercice 1933-1934. Section VII : Service de Documentation, p. 10. Institut Scientifique de Recherches Économiques et Sociales, rue Michelet 4, Paris VI, 1934.

Lemaître (Henri), "La documentation de l'Institut de Recherches Économiques et Sociales." 8 pp. Extrait de la revue "Archives et Bibliothèques," No. 1, 1935.

in a special cabinet to suit the size of the cards. A simple card-index was used to record the current receipt of periodicals, the number of which was not yet sufficient to necessitate the adoption of the "Kardex" system. The unbound parts of periodicals were filed in loose-leaf binders; these and the books were stored on temporary wooden shelves, with direct access for readers. The collection of financial and economic reports, which already forms an archive of more than 6000 documents, is accommodated in a neat set of pressed steel cabinets around the walls of the committee room. These reports are classified in accordance with the same lettered scheme as is used in the Bourse: Ra *Assurances*, Rb *Banques*, Rc *Canaux*, and so forth in 20 main divisions, each of which can be still further sub-divided. This documentation provides the necessary raw material for the current statistics (*recherches permanentes*) which are computed by the mathematical staff of the Institute, charted in colours (rather like alpine silhouettes), and published under the title of *Tableaux de l'Économie française* at a price of 150 francs.

The library also maintains a current international newspaper file, from those of economic importance, such as "Le Temps" or the "Manchester Guardian," which are examined on receipt. Each article to be filed is indicated with pencil, and the classification is noted at the same time. The articles are mounted on sheets of uniform size; in the upper left-hand corner is written the name of the newspaper and the date, while in the opposite corner appears the classification. There is also a special mark used to differentiate those articles which are not to be retained for more than three months, since it is most important not to encumber the files with material which is not of permanent interest.

CHAPTER IV

SCIENCE LIBRARIES ON THE EUROPEAN CONTINENT

It was with much reluctance that the writer said "au revoir" to his dear friends in the *Bibliothèque Nationale*, and left Paris to penetrate further into this mad continent of Europe. Ever since the Tower of Babel, we scientific librarians who must think and work internationally, have been handicapped with an utter confusion of different words and word-systems to express identical notions.¹⁵ The idea of a *Weltsprache* is full of fascination¹⁶ but, in spite of broadcast telephony and other modern facilities for international communication, it must unfortunately remain a practical impossibility for many years (perhaps even centuries) to come. A nation's *Muttersprache*, unlike such artificial word-systems as "Esperanto," evolves as the natural expression of racial temperament, which in turn is ultimately determined by the local climatic conditions, the soil, the characteristic landscape of the country. As Spain differs from Sweden, so must the mentalities of the two respective peoples, and their naturally evolved modes of expression. If by a miracle we could have a universal *Weltsprache* to-day, it would very soon become idiomised

¹⁵ "Therefore is the name of it called Babel; because the LORD did there confound the language of all the earth." Genesis XI, 9.

¹⁶ Niemann (W. B.), "Dezimalklassifikation und Weltsprache. Eine kritische Betrachtung," 96 pp. quarto. R. Kiepert, Berlin-Charlottenburg, 1933. See also: Wüster (Eugen), "Internationale Sprachnormung in der Technik." 449 pp. VDI-Verlag, Berlin, 1931.

locally ; it would become latinised, teutonised. Our friends the French would find it necessary to express the equivalent of "tiens," and the Germans would soon develop their own national idioms, such as "bitte schön," characteristic and untranslatable. On the other side of the Atlantic, our American cousins have already evolved what is known in Europe as "Amerikanisch."

Another hindrance to the internationally minded scientific librarian, quite apart from the Tower of Babel, is selfish nationalism, as the result of which this sad continent has become far removed from our ideal of the "United States of Europe." But we scientific librarians must work on a broader, more fundamental basis ; our purpose is to serve the constructive technical man who, as pointed out elsewhere,¹⁷ plans and carries out international power schemes with transmission lines thrust across frontiers which, to a politician, constitute insurmountable barriers.

In order to collect at first hand the information recorded in this chapter, it was necessary to cross nine political frontiers, in spite of all the formalities with which narrow-minded nationalism threatens to hamper such international studies, not to mention "the brotherhood of mankind." The tour was not confined exclusively to libraries of specialised scientific or technical scope, but included some university and public libraries, as well as the celebrated *Répertoire Universel* in the Palais Mondial at Brussels, on account of its interest from the pure librarianship point of view. It will be found that the various sections on comparison betray a sad lack of uniformity in their treatment. The writer did not set himself out to analyse and collate special aspects in

¹⁷ Spratt (H. Philip), "International Co-operation in Technical Science," *European Herald*, 28 September, 1934, p. 11.

detail; he jotted down in his note-book whatever features of special interest happened to attract his notice at each of the libraries visited. Moreover, the said note-book has not been elaborately edited or "polished" for publication. The notes which follow should therefore be accepted as an objective review; those who do not look for a philosophical treatise will not be disappointed.

BIBLIOTHEEK der TECHNISCHE HOOGESCHOOL, DELFT: The technical university at Delft is the only one in Holland, and is attended by about 1500 students. The various departments and institutes are (as in London) situated in different parts of the town which, with its narrow streets and canals, and its quaint, old-fashioned houses, forms a remarkable contrast to the modern scientific laboratories. There are 15 specialised libraries in these various departments, in addition to the central library which alone contains 120,000 volumes, exclusive of pamphlets. The entrance hall, which contains the loans department, exhibition of newly acquired books, and the card-index system, is in the form of a cloister. There are alphabetical author, subject, and systematic card-indexes. The reference room is decorated with some remarkable symbolic illustrations of the various aspects of science, invention and industry. Each year, the new students receive an initiative lecture and course of instruction on the technique of the library, to help them make the best use of it, in the course of their studies at the technical university. All volumes are bound, and all index cards are printed, on the premises. The machine in which this is done, is a simple and presumably inexpensive hand press.

As the ideas of the librarian, Dr. A. Korevaar, are in

some respects contrary to my own, I appreciated all the more a discussion with him on matters of technical librarianship. Since his nomination in 1925, he has done much to rationalise the work of the library. In the first place, it had been necessary to draw up a standard code for index entries; because for 25 years previously, the staff had followed their own personal views, without any effort at unification. These rules for the compilation of title-entries have now been published in booklet form.¹⁸ Then the subject-matter index had to be reconstructed, for which purpose the Dewey and the Brussels decimal classifications had been considered, but after trials which yielded unfavourable results, both had been rejected. Dr. Korevaar considers that all systems for scientific classification must necessarily become obsolete after a time, and require complete revision at about 25 year intervals; it is therefore of prime importance that the system should be "elastic" to permit of such periodical revision. Usually it means that a whole index of cards would have to be re-numbered individually; an insurmountable difficulty in most libraries. At Delft, however, the system is so "elastic" that only the main index cards at the head of each section need to be renewed. However, it appeared to me to be rather overburdened with cross-references, as is inevitable with an alphabetical subject-matter index.

Dr. Korevaar considers (and here I differ from him) unification in classification to be not only impracticable, but even injurious for many libraries. He considers that for each librarian to classify and index his collections in the most efficient manner, he must choose the system which he finds best suited to his particular purpose.

¹⁸ Korevaar (Dr. Ir. A.), "Titelbeschrijving aan de Bibliotheek der Technische Hoogeschool te Delft." 82 pp. Technische Hoogeschool, Delft, 1933.

No *one* system (even the decimal classification) could possibly be at the same time the most efficient for all libraries, with their various scopes and purposes. As he says, "We do not make book collections for the sake of classification, but we classify for the sake of the book-collections; the classification must be subservient to the collections, their different natures and their special purposes; these demand different systems for their efficient classification, and unification would be a drawback and a nuisance in many cases." However, Dr. Korevaar evidently considers unification in librarianship desirable to a certain extent; in fact, he complains of its lack, in connection with the Dutch technical union-list which he compiles with the collaboration of 39 technical and industrial libraries in Holland. Most of these libraries, he says, have not trained librarians, and "send us a lot of defective titles, which require a lot of correction to be done, before the titles can be inserted into the alphabetical union-list." Thus we are led back to the conviction that even for such collaboration within small limits, unification of methods is desirable; for those of us who must think and work internationally, it is essential.

INSTITUT INTERNATIONAL DE DOCUMENTATION, PALAIS MONDIAL, BRUXELLES: In the course of an international conference held at Brussels in 1895, this Institute was founded in order to perfect and standardise methods of documentation on an international basis, and to compile a universal classified *répertoire* or card-index of all literature and science. For this latter work, three principal methodic elements were felt to be essential: (i) the adoption of a code of uniform editorial rules for the preparation of entries into the alphabetical

author index, (ii) an international subject classification scheme with pure numerical notation, and (iii) a mobile index card of standard size as international unit. On these three foundation stones, the whole edifice of the *Répertoire Universel* has been built. This enormous (even monstrous) index contains at present more than 13,500,000 cards of the standard international size, 125×75 mm. (5×3 in.), classified in accordance with the *Classification Décimale Universelle*.¹³ Thanks to the courtesy of its devoted parent, Monsieur Paul Otlet, the writer was able to inspect this *Répertoire* in some detail. It consists in all of seven distinct sections. First we have the alphabetical author index (*répertoire* N) which also contains entries of anonymous works under their titles, and the publications of corporate bodies; in order to have this section completed as soon as possible, use was made of references extracted from the printed indexes of the most important libraries. The alphabetical index of periodicals under their titles (*répertoire* NR) contains entries of reviews, journals, independent periodicals, and transactions of societies and institutions; this has been extended in recent years, because of its direct use to the Institute as basis for documentation work on the individual articles. The alphabetical index of book-titles (*répertoire* NT) is useful when only the title of a particular work is known to the searcher; it is, however, of secondary importance.

The *tour de force* of the Palais Mondial is the subject-matter index (*répertoire* A) which is minutely classified in accordance with the *Classification Décimale Universelle*; there is also another subject-matter index (*répertoire* B) in which the references are not so minutely classified. In the above index A, references to works of localised interest have the sub-divisions of place (continent,

country, province, or town) added *after* the subject classification ; there is also another index (*répertoire* AG) in which the order is reversed, so that all works relevant to a certain place are collected. The index of articles in periodicals (*répertoire* NRT) constitutes in principle a duplicate, or double check, of the other sections in which articles are indexed either under the names of the authors, under their titles, or in accordance with the subject-matter ; in this index, however, the articles are entered under the title of each periodical in order of date. It is curious, the effect which the *Palais Mondial* has on the susceptible ; it struck me as sepulchral, and a friend of mine referred to the card cabinets as "coffins." However, this monumental work shows what can be achieved with international co-operation and a pure numerical classification which obviates all difficulties due to the Tower of Babel.

BIBLIOTHÈQUE de l'UNIVERSITÉ LIBRE, BRUXELLES : The university and its library (which was founded in 1836) are now housed some distance out from the centre of the town, in splendid new premises built since the war with American capital. The library is, therefore, of quite modern lay-out. It serves all the faculties of the university, and the fact that the whole of the literature (more than 100,000 volumes) is here classified, shelved and located with help of the *Classification Décimale*, demonstrates the scope and efficiency of this international system. About 1100 current periodicals are received. The card-index cabinets form the partition between the offices and the main hall of the library ; the drawers are double-ended, and can be opened in both directions. This renders the whole card-index immediately available to both readers and librarians, and at the same time

obviates the need of a duplicate set. The system had, I was told, led to many of the obvious kinds of practical joke to be expected from mischievous students; but in serious use, such coincidences when a drawer is pulled in both directions at once, are quite rare. The main hall is spacious and well lit; a remarkable symbolical picture decorates the whole of one end.

BIBLIOTHEK der TECHNISCHEN HOCHSCHULE, AACHEN: The library is housed in a self-contained block near the various institutes of the Technical University. It dates back to the year 1872. The complete index to the collection consists of a printed bound hand-list of the old-fashioned kind, with five supplementary volumes up to the year 1921, when Herr Carl Walther was appointed librarian, and started a modern card-index for new accessions. In 1923 the library contained 15,000 volumes; the number has now increased to 105,000 volumes, with 550,000 German patent specifications. In six years' time, the store room will need to be extended. The library receives 850 periodicals on technical science, 600 of which are laid out for open access. The staff consists of four librarians and four lady-assistants. The loans department has developed rapidly in recent years; a visible card-index has been found most efficient, and saves the time of the staff.

Walther is a supporter of the *Classification Décimale*, and hopes in due course to have his whole library indexed on this system. In addition to the usual author, subject-matter and systematic indexes, he has a separate "location" index, in which each individual (binder's) volume has one card only. This index is to enable any required volume to be immediately located

on the shelf; also, it shows accurately the total number of volumes in the whole collection. The store rooms are of modern ferro-concrete fire-proof construction, and there is an exceptionally fine collection of complete series of the world's most important scientific and technical periodicals from their first numbers. This library should be of particular value to students in the history of technical science.

PREUSSISCHE STAATSBIBLIOTHEK, BERLIN: With the *Preussische Akademie der Wissenschaften* and the *Universitätsbibliothek* (described in the next section), the Prussian State Library occupies an extensive island site on Unter den Linden. It contains at present about 2,750,000 volumes, with 63,500 manuscripts, 6300 incunabula and 85,000 portraits; this is certainly the most important of all German collections, except that the *Bayerische Staatsbibliothek* in München is perhaps richer in old manuscripts and incunabula, and the *Deutsche Bücherei* of the *Börsenverein der Deutschen Buchhändler* (described on p. 86) possesses a somewhat more extensive collection of minor literature, such as school-books subsequent to about 1912. The library receives copies of all official publications of the *Deutsches Reich*, the dissertations of German universities, and all books and periodicals issued in Prussia; a complete collection of German scientific literature is acquired, as well as a fair proportion of that from Austria and other countries abroad. Accessions from the *Preussische Akademie der Wissenschaften* are received after a certain period; and the library also acts in close collaboration with the German *Reichstauschstelle* and the *Deutsch-Ausländischer Buchtausch*. The total accessions amount to about 65,000 volumes per annum; and more than 23,000 current periodicals

are received, in which number are included the transactions and annual reports of learned societies and corporate bodies.

In addition to those in the special departments, there are three main indexes to the collections: (i) an alphabetical bound index of about 3300 volumes for the use of readers; this is in two sections, one for authors and the other for anonymous works, (ii) a bound subject-matter (systematic) index of more than 1700 volumes, which serves also as shelf-list, and (iii) an alphabetical card-index reserved for internal use of the librarians. No manuscript entries are made in these, but printed references from the *Berliner Titeldruckstelle* are used; title-slips are pasted in the volumes of the two bound indexes, while in the third (card) index, the standard printed cards (125 × 75 mm.) are intercalated. Since the year 1926, the subject-matter index of the technical department has been built up in modern card-index form; there is also an alphabetical catch-word index to the subject classification scheme. The alphabetical index is compiled in accordance with the approved rules.¹⁹ Most of the books are shelved systematically in three sizes (under 25 cm., between 25 and 35 cm., and over 35 cm.); but in the technical department, it has been decided to shelve them in accession order, at least within their broad subject-matter divisions. The main domed hall of the library has seats for 360 readers, and more than 25,000 volumes of reference works are shelved around the walls; six new balconies are now in course of construction. There are also four smaller reference rooms for periodicals, manuscripts, music, and oriental books. The staff consists of more than 60 librarians, with

¹⁹ Instruktionen für die alphabetischen Kataloge der preussischen Bibliotheken (2. Ausgabe: Fassung vom 10. August, 1908). Preussische Staatsbibliothek, Berlin.

a personnel of 300 operatives. For much valuable assistance in the collection of material for these notes, the writer's best thanks are due to Dr. Joris Vorstius.

The internal transport equipment comprises numerous pneumatic postal tubes for quick despatch of readers' requisition forms. Books are delivered in wooden boxes $50 \times 33 \times 26$ cm. ($20 \times 13 \times 10$ in.), with the help of continuous lifts (paternosters) and horizontal transport bands; their subsequent return to the stacks is automatic. The library has its own photostat equipment, an extensive book-bindery department, and self-contained power plant; all notices, forms and similar small work in connection with internal administration, are printed on the premises. In contrast to other European national libraries (such as the *Bibliothèque Nationale* and the British Museum, which are only available for internal reference), the *Preussische Staatsbibliothek* still maintains the most extensive loans service in Germany. To keep this within reasonable limits, certain restrictions have been imposed in recent years; for example, since 1933, the rate for borrowers' tickets has been increased to RM. 10.00 per half-year, and these are only issued to persons occupied with scientific or other serious research work. Those who require fiction or so-called "schöne Literatur" are referred to the municipal public libraries. In spite of all this, the number of borrowers has remained at about 15,500, to whom some 360,000 volumes are lent per annum. In addition, under the auspices of the *Deutsche Leihverkehr*, about 65,000 volumes are sent out on inter-library loans. Other activities of the *Preussische Staatsbibliothek* as national library, consist in the formation of the *Auskunftsbüro der Deutschen Bibliotheken*, which since 1905 has acted as central information bureau for German libraries;

the *Berliner Titeldruckstelle*, founded in 1892, has now entered into close collaboration with fourteen other Prussian libraries, as well as the *Nationalbibliothek* in Wien and nine other Austrian libraries.

The most important event of recent years, however, has been the appearance of the enormous union-list²⁰ of the *Preussische Staatsbibliothek*, fifteen Prussian university and *Technische Hochschule* libraries, the *Bayerische Staatsbibliothek* in München and the *Nationalbibliothek* in Wien, after forty years of patient work.²¹ The third volume was published in June 1933; each volume contains about ten to twelve thousand entries, without cross-references. The method of alphabetical compilation conforms to the approved rules,¹⁹ whether for titles of works, or names of authors. For the benefit of the uninitiated, to whom the *Instruktionen* are not understood, copious cross-references are provided, which constitute in fact about 35 per cent. of the entries. The complete work will consist of about 150 volumes, and will thus be a massive product of German patience and care. Considerable support has been received from the Rockefeller Foundation, who have provided for the publication of three volumes per annum for the next five years. Later on, there may be an acceleration in the annual rate of production. Appearance of the first three volumes has been hailed by German librarians as an event of the

²⁰ Gesamtkatalog der Preussischen Bibliotheken mit Nachweis des identischen Besitzes der Bayerischen Staatsbibliothek in München und der Nationalbibliothek in Wien. Herausgegeben von der Preussischen Staatsbibliothek. Preussische Druckerei- und Verlagsaktiengesellschaft, Berlin.

²¹ Kuhnert (Ernst), "Zur Entstehung und Gestaltung des Gesamtkatalogs." Zentralblatt für Bibliothekswesen, Jahr. 49, Heft 3 (März, 1932), p. 117.

Fuchs (Hermann), "Der Gesamtkatalog der Preussischen Bibliotheken." Institut International de Documentation, XIIe. Conférence Rapports, p. 46. For a detailed review of the first volume, see also: Zentralblatt für Bibliothekswesen, Jahr. 49, Heft 3 (März, 1932), p. 148.

first importance; not only in Prussia for the libraries which it includes, but all over Germany because of its importance to the remainder.²² In these, it serves (i) for the revision and amplification of their own card-index entries, (ii) as a bound index, when their own classification and shelf numbers are added after each entry, and (iii) as a basis for preliminary work on a comprehensive German union-list. Thus we find that German documentation will tend more and more to become centralised in the *Preussische Staatsbibliothek*, as an indispensable factor in scientific research work.

UNIVERSITÄTSBIBLIOTHEK, BERLIN: The library of Berlin University adjoins the *Preussische Staatsbibliothek* in the famous boulevard *Unter den Linden*, and has a history²³ which dates back more than a hundred years. It is perhaps the finest example of a German library devoted almost entirely to the requirements of university educational activities, and is certainly an important centre for scientific research in Berlin. The collections amount to about 430,000 volumes, and some 600 current periodicals are received. Particular importance is attached to university dissertations. There is an alphabetical bound index in about 1200 folio volumes; a modern alphabetical card-index has also been built up since 1909, and is intended for use of the public. The international

²² Claussen (Bruno) and Port (Wilhelm), "Der Wert des Preussischen Gesamt-Katalogs für die übrigen Bibliotheken." *Zentralblatt für Bibliothekswesen*. Jahr. 50, Heft 6 (Juni, 1933), p. 421.

Redenbacher (Fritz), "Der Gesamtkatalog und die nichtangeschlossenen Bibliotheken." *Zentralblatt für Bibliothekswesen*, Jahr. 50, Heft 8-9 (Aug.-Sept., 1933), p. 536.

²³ Martell (Paul), "Zur Geschichte der Universitätsbibliothek zu Berlin." *Die Warte*, Bd. 27 (1934) Nr. 21, p. 77. See also: *Deutsche Akademische Rundschau*, Bd. 8 (1926-27) H. 16 and 17.

Hoecker (Rudolf), "Die Universitätsbibliothek zu Berlin: Zu ihrem 100-jährigen Bestehen, 1831—20. Februar—1931." 58 pp., illus. Gedruckt in der Preussischen Druckerei- und Verlags-A. G., Berlin, 1931.

standard size for index cards, 125 × 75 mm. (5 × 3 in.), is used here, but decimal classification has not been adopted. A numerical scheme is used to a limited extent, but not carried to such minute sub-division as in the Brussels system¹³; the books are then shelved in order of accession number within each broad division of the subject classification.

The spacious hall of the library has seats for 300 readers; separate electric lamps are provided at each table. Four balconies of shelves around the walls accommodate a reference collection of about 37,000 volumes. The staff consists of 70 librarians and assistants. With reference to the use made of the library, recent statistics show that with more than 16,000 borrowers, it is not far behind even the *Preussische Staatsbibliothek* itself. In one year, in response to 212,000 readers' requisitions, no less than 167,000 of the respective volumes were delivered; this is surely eloquent of well-planned collections and efficient administration.

BIBLIOTHEK der TECHNISCHEN HOCHSCHULE, BERLIN: Situated in the "west-end" of Berlin, about three miles from the *Preussische Staatsbibliothek*, this library has been developed primarily to meet the educational requirements of the Technical University; and contains at present about 210,000 volumes on pure and applied science. Its usefulness is not, however, restricted to the professors and students, but the public have also free admittance from 9 a.m. to 7 p.m. About 1200 current periodicals are received, most of which are placed on open access. External loans amount to more than 45,000 volumes per annum. There is the usual alphabetical author card-index, and a separate catch-word subject index.

What appealed most of all to the writer's mechanical turn of mind, however, was the *Adrema* machine, which Dr. Albert Predeek, the librarian, has adapted to the special requirements of scientific documentation.²⁴ One of the most serious problems in such work is to find a cheap and reliable process for the reproduction of printed cards. For the routine compilation of selective book-lists, the scientific librarian also requires some means for the mechanical selection of references, and a process which will enable these to be reproduced (without the need to re-check for printers' errors) in the form of a continuous book-list. A certain measure of success in the solution of these problems has been achieved with the *Adrema* machine, the usual function of which is to print addresses on envelopes, where quantities of routine "circular" correspondence have to be dealt with. In the *Bibliothek der Technischen Hochschule* it is, however, used to print index cards at the rate of about 5000 per hour. Each reference is embossed on a zinc plate, the subsequent printed reproductions from which need not, of course, be re-checked for errors. The plates measure 110 × 55 mm., and have space for references with 8 lines, each of 46 letters. These are embossed in an electrically driven machine, and do not require much more time to produce than do manuscript entries. The basic documentation thus consists of a "plate-index" rather than a card-index.

The entries from a series of plates can be printed on cards, or in the form of a continuous list; but the most

²⁴ Predeek (Dr. Albert), "Die Adrema-Maschine als Organisationsmittel im Bibliotheksbetriebe." 22 pp., illus. Organisation Verlagsges. m.b.H. (S. Hirzel), Berlin, 1930.

Predeek (Dr. Albert), "Die mechanische Herstellung und Auswertung des technisch-wissenschaftlichen Literaturnachweises." 33 pp., illus. Publicatie No. 51, Nederlandsch Instituut voor Documentatie en Registratuur, Den Haag, 1930.

remarkable feature of this machine, which renders it so useful in the routine compilation of book-lists, is the manner in which it can be set automatically to select and print references from the plates on certain desired subjects, and to allow the remainder to pass unprinted. For this purpose, the references are divided into thirteen subject classes, in accordance with which the plates have embossed projections in one or more of thirteen possible positions. To correspond with these, the *Adrema* machine has thirteen selector switches or stops, to enable it to be set for the mechanical selection of those plates whose embossed projections correspond with the desired subject classes for a special book-list. When all thirteen selector switches are set in the "on" position, the machine prints from all the plates without exception, and a complete accession-list is produced. But even when the machine is set to select the plates of certain classes, and to allow the remainder to pass unprinted, the initial sequence of the pack remains unaltered. The plates as issued from the machine, after the mechanical selective process, are thus maintained in their correct order for replacement in the store-cabinets; the tedious manual intercalation of references which have to be replaced in a card-index, after their use for selective compilation in the usual manner, is thus eliminated.

This mechanical selective documentation with embossed metal index-plates has already been reviewed in some detail²⁵; it now remains to describe the advances which have been accomplished last year. The addition of an accessory switchboard now renders it possible for the machine not only to select different subject-matters, but also to discriminate in accordance with so-called "points

²⁵ Spratt (H. Philip), "Scientific (technical) libraries." *Year's Work in Librarianship*, vol. IV (1931), chap. III. Library Association, London, 1932.

of view." This switchboard has two rows of thirteen switches ; the number of possible inter-connections is therefore $2^{13} = 8192$. Each combination of switches sets the machine to select the index-plates by virtue of the embossed projections which constitute their mechanical differentiation. The machine selects one or more subject-matters ; one or more "forms" (*i.e.* author-works, periodicals, series, publications of institutions, etc.) ; one or more countries or continents concerned (Germany, Europe, America, etc., or international) ; one or more *Sprachen* (German, French, etc.) and finally discriminates between those publications which are to be found in the reference room or not. For example, if the librarian be asked what literature he has on transport, published as a periodical, with particular reference to America, written in German, and not to be found in the reference room ; he merely sets his *Adrema* machine for : *Verkehrswesen, Zeitschrift, Amerika, Deutsch, Nicht im Lesesaal* ; and turns the switch. The machine then proceeds to search, and examines with undiminished speed or precision about 70 index-plates per minute until further orders. Dr. Predeek also showed me a recently acquired completely automatic photostat machine, which turns out excellent photo-copies within 10 minutes. This was supplied from Siemens-Schuckert.

BIBLIOTHEK des VEREINES DEUTSCHER INGENIEURE, BERLIN : The library of the V.D.I. (the German national technical association, of which the writer is a member) contains at present more than 16,500 volumes of technical literature, 4000 volumes of bound periodicals, and 4000 technical theses. About 900 current periodicals are received, of which more than 200 are available on open access ; these are stood up vertically in racks (not laid

out on horizontal shelves), so that the titles alone appear. In this way the periodicals take up much less space, are more easily visible, and do not collect the dust to the same extent. The use of the library is primarily reserved for members of the *Verein*, but this rule is not strictly adhered to in practice. There is a very efficient documentation and information service²⁶ based on a card-index of all important technical books, and articles in periodicals of the last 15 years. This has the usual alphabetical author and subject-matter indexes. The latter is not yet decimally classified, but I understand that this may be done in the near future; also that decimal classification numbers will be used in their excellent periodical documentation review, the *V.D.I. Technische Zeitschriftenschau*.

INDUSTRIE-BIBLIOTHEK der ALLGEMEINEN ELEKTRIZITÄTS GESELLSCHAFT, BERLIN: In this specialised industrial and technical library, all the literature is classified by the *Dezimalklassifikation*,¹³ of which the librarian is an enthusiastic supporter. He also avoids the doubts and difficulties involved when periodicals are shelved in alphabetical order of their titles, and has them all numbered for identification. As the book-stores are accessible only to the library staff, it is not necessary to have the titles printed on the backs of bound volumes of periodicals, and their identification numbers, with the year and volume numbers, therefore appear as their sole indication when shelved. This is easier for the staff to read than would be the smaller letters of the full or abbreviated titles, particularly where the shelves may not be well illuminated. Moreover, since these

²⁶ Pfeiffer (Ehrenfried), "Der Literaturnachweis des Vereines deutscher Ingenieure." Institut International de Documentation, Vorträge der 11. Konferenz, Frankfurt-am-Main, Zweiter Band, p. 243.

identification numbers are stated when the publications are requisitioned, the whole system for the location of volumes on the shelves is so simplified that an unskilled staff can deal with it.

In addition to the above numerical system for the identification and location of volumes, the librarian has also advocated an attractive scheme for the numerical classification of periodicals in accordance with the times at which their successive issues appear. For example, 52.6 denotes a weekly periodical published on Fridays; 26.4 denotes a bi-weekly periodical published on Wednesdays; and 24.5 : 20 would denote a half-monthly periodical published on the 5th and 20th of each month.

BIBLIOTHEK FÜR KUNST UND TECHNIK, FRANKFURT-AM-MAIN : The visits to libraries in Frankfurt, Darmstadt and Mainz were made in connection with the conference of the *Institut International de Documentation*²⁷ held here under the supervision of the librarian, Dr. Walter Schürmeyer. This is a modern piece of architecture; the main hall, open to the public, is spacious and comfortable, and there are a number of smaller studies in addition to the main lecture hall, in which the sessions of the conference were held. The book-stacks contain at present about 75,000 volumes on technical science and the applied arts; about 220 current periodicals are received, and placed on open access.

In addition to the alphabetical author index, the whole of the collections are also indexed in accordance with the Brussels decimal classification.¹³ External loans amount to about 19,500 volumes per annum. In the course of the conference, an exhibition was set out to

²⁷ Spratt (H. Philip), "The Frankfurt Conference of the International Institute for Documentation." *Year's Work in Librarianship*, vol. V

illustrate modern library equipment, such as visible file indexes, photostat apparatus, and the application of the *Adrema* machine in selective documentation, which has been adopted with considerable success in the *Bibliothek der Technischen Hochschule* at Berlin, for example (see p. 78). A scheme has now been worked out in detail for the direct mechanical selection of decimal references to six places; that is, up to 999,999 or one million classification sub-divisions.

STADTBIBLIOTHEK, FRANKFURT-AM-MAIN: This picturesque old library dates from the seventeenth century, and is therefore not laid out on modern "efficient" lines. It fulfils the double function of university and municipal library, and is open to the public from 9 a.m. to 1 p.m. and from 3 to 7 p.m. The collections amount at present to about 600,000 volumes on pure and applied science, medicine, literature and art, with 83,000 university theses, 6000 manuscripts, and about 2000 incunabula. I was shown some fine examples of the book-binder's art. There is a manuscript index to the collections, and a printed card-index is in course of preparation. An *Adrema* machine was in operation here, but not with the mechanical selective device mentioned above. Some 4000 current periodicals are received. External loans amount to about 66,500 volumes per annum. In the book-stacks, overhead sprinklers were provided with automatic thermostat control, to come into operation in case of an outbreak of fire.

HESSISCHE LANDESBIBLIOTHEK, DARMSTADT: The writer visited Darmstadt in order to see the reconstruction of this ancient library (founded 1567) in the former

Grand Ducal Palace. The collections contain at present about 725,000 volumes, with 3900 manuscripts and about 2500 incunabula. This reconstruction has necessitated a lot of work, both material and mental. Considerable structural alterations had to be made, and a modern card-index to the whole literature collection had to be built up. Decimal classification has not, however, been adopted here. The current periodicals are well set out on racks, and can be located with ease. About 155,000 volumes per annum are issued on loan to the public.

STADTBIBLIOTHEK, MAINZ : Founded in the fifteenth century, with a beautiful situation on the banks of the Rhein, the municipal library of Mainz is open to the public from 9 a.m. to 1 p.m. and from 3 to 7 p.m. The collection at present numbers about 325,000 volumes, with copies of all dissertations from the universities of Giessen and Darmstadt, about 1200 manuscripts and 2800 incunabula; some 335 current periodicals are received. There are alphabetical author and subject-matter card-indexes, and a separate shelf-list. In the *Stadtarchiv* are preserved the valuable old manuscript parchments (with the most elaborate seals) which relate to the municipal affairs of Mainz from historical times. There was a fine exhibition of Goethe manuscripts and early prints, letters and portraits, assembled in connection with the centenary celebrations. Of particular interest was the *Welt-Museum der Druck-Kunst*, founded in 1900, which is housed on the same premises. In a small room reconstructed as an old-time printers' workshop, one of the earliest wooden-screw hand presses has been erected, and is shown in operation; molten lead is also kept in readiness, so that one can see the

primitive manner in which the letters were cast in those times. The printers were dressed in the costume of the period, and examples of their work could be purchased fresh from the press. This practical productive method of demonstration struck me as a most effective museum technique.

DEUTSCHE BÜCHEREI, LEIPZIG: This institution is situated in the open, about half an hour's walk from the town, in the direction of the enormous *Völkerschlachtdenkmal*. It is not a State institution, but a foundation of the *Börsenverein der Deutschen Buchhändler*, who in 1870 initiated the ambitious scheme to form a complete collection of all German literature, and all that contains German *résumés*. In the year 1913, the work of collection was commenced. The town donated the land for the site, and one-fifth of the cost; two-fifths came from the State of Saxony, and two-fifths from the *Deutsches Reich*. The structure was commenced in 1914, and completed in 1916. One-sixth of the entire project, of which I was shown a model, is now built. The site allows ample space for later expansion, and an ultimate accommodation for ten million volumes. The collection at present contains more than a million volumes. The rate of accession is about 70,000 per annum; some 60,000 periodicals are received, but no newspapers.

The subject-matter index of the *Deutsche Bücherei* is in principle alphabetical but, as is to be expected of such an extensive index, it shows marked tendencies to systematisation and resultant breakdown of pure alphabetisation. Readers' tickets are issued at RM. 5.00 per annum. The main hall has accommodation for 500 readers; it is well lit, and the interior decoration is pleasant. At the time of my visit (which was on a Sunday), it was not open to

the public, but I was told that as a rule it is well visited by readers, who are admitted on weekdays from 8 a.m. to 10 p.m. The *Deutsche Bücherei* contains some spacious conference rooms, and well equipped lecture halls which are used for papers and discussions on German literature, scientific and technical subjects, the book industries, and questions of library technique. One of the most valuable publications of the *Deutsche Bücherei*, is the German national book-list, of which a special library edition²⁸ is issued each week. This is printed on one side only of the paper, in order to enable its references to be cut out and mounted on the international size index cards.

BIBLIOTHEK des DEUTSCHEN MUSEUMS, MÜNCHEN : The library of the *Deutsches Museum* (the German national museum of technical science) constitutes a German counterpart of the Science Museum Library in London. It was opened to the public in 1933, and has set itself to collect the valuable literature of all times and all nations on the exact or technical sciences. The collection amounts at present to 152,000 volumes, 600,000 patent specifications, 43,000 maps and technical plans, 7000 portraits, and more than 13,000 manuscripts and documents. In the treasures of the library are to be found letters of M. Faraday, A. von Humboldt, Jos. von Fraunhofer and others, fine examples of Venetian incunabula from the press of Erhard Radtolts, the classical works of ancient science, such as Apian, Copernicus, Kepler, Ramelli, Zonca, Veranzio, and other valuable rarities. The accessions of the library amount to about 8000 volumes per year, most of which (about

²⁸ Deutsche Nationalbibliographie (Bibliotheksausgabe), bearbeitet von der Deutschen Bücherei, herausgegeben und verlegt vom Börsenverein der Deutschen Buchhändler zu Leipzig.

75 to 80 per cent.) are presented by authors and publishers. More than one tenth of the entire collection is available on open access, for the immediate use of readers. Publications from the book-store are placed at the disposal of readers, in response to written requisitions, in the spacious hall which can comfortably seat more than five hundred. Requisitions are made on forms similar to those used in most public libraries in Germany, and are dealt with immediately. Since 1931, the books have been shelved in simple order of accession number; separate volumes, series and periodicals are, however, kept apart.

The new book-store, which is not yet completed, will accommodate about 1,000,000 volumes on steel shelves. In the reference room the books are shelved systematically, but within each main subject-matter division, alphabetically under the authors. Just in front of the racks, at table level, a horizontal book-list is provided, which shows exactly the order of the books on the shelves above. The various card-indexes to the whole collection are accommodated in a central room open to the public. Author and subject-matter indexes are kept separate; the former is compiled in accordance with the approved rules.¹⁹ The index cards of the international size, 125 × 75 mm. (5 × 3 in.), are either in manuscript, or mounted with printed references clipped from the special one-sided library edition of the German national book-list.²⁵ A catch-word index serves for subject-matter classification of the collections. This is built up alphabetically in main sections, under which the smaller sub-divisions are to be found. Where necessary, cross-references from the sub-divisions to their main sections are provided; for example, *Neonröhren*, *siehe Leuchtröhren*. When any sub-division becomes so extensive

is to approach the size of a main catch-word section, it is transformed into a separate section. Thus there must also be cross-references from the main sections to some of their more important sub-divisions; for example, *Turbinen, siehe auch Dampfturbinen*. The main sectional catch-words from the alphabetical subject-matter index are also collected into a separate systematic index, which enables them to be more easily located in some doubtful cases. The decimal classification has, however, not been adopted at München. The accessions book serves as an inventory of the collections. The current periodicals received in the library (about 2300 in all), are entered up on a visible card-index (*Kardex* system), so that any number not duly received is clearly indicated. The latest issues of periodicals are laid out in systematic subject order for open access to readers, and correspond with the order in which the books are shelved. A special room is reserved for newspapers, of which those with scientific and technical contents are retained. A refreshment room is also provided for the readers, with about 100 tables. The library of the *Deutsches Museum*, with its well planned lay-out and adequate scope for subsequent extension, will in future become an important centre of documentation for scientific and technical literature.

SCHWEIZERISCHE LANDESBIBLIOTHEK, BERN: The new premises of the Swiss National Library at Bern are an example of the most modern architectural style²⁹ characteristic of reinforced concrete construction. "The

²⁹ Meyer (Peter), "Die Schweizerische Landesbibliothek in Bern." 57 pp. Bern, 1931. See also: *Revue des Bibliothèques*, 1932, p. 195; *Library Association Record*, Jan., 1932, p. 17; and

Leyh (Georg), "Das neue Gebäude der Schweizer Landesbibliothek." *Zentralblatt für Bibliothekswesen*, Jahr. 51, Heft 1-2 (Jan.-Feb., 1934), p. 47.

people of Berne at first were somewhat surprised, not to say shocked. . . . The almost cubist style was so new to them that their first reaction was one of rebellion." It is, however, essentially a librarian's library, not an architect's; and "si ce bâtiment aux apparences ultra-modernes ne donne pas beaucoup de satisfaction au point de vue esthétique, il est par contre admirablement installé, intérieurement, pour les nécessités du service." If the exterior, as a work of art, is open to criticism, the interior is admirable. Since a library is built to house books, it is reasonable to take the shelf as a basic unit for the whole construction. At Berne, the unit of measure adopted has been the distance between two rows of shelves, which is 1.52 metres or 5 feet; all other dimensions are simple multiples of this, so that harmonious proportions are assured.

A full account of the library, its history and collections, has recently been published by its director.³⁰ It contains at present more than 600,000 volumes; and receives copies of nearly all Swiss publications, which are listed in its monthly accession bulletin, *Le Livre en Suisse*. The entries are cut up and pasted on cards of international size; this work is done by convicts in a nearby prison.³¹ From 1927 onwards, the library has published a special index of Swiss scientific literature.

BIBLIOTEKA NARODOWA, WARSZAWA: For the last three years, the National Library of Poland has been temporarily housed in the modern premises of the Commercial University at Warsaw, where space for

³⁰ Godet (Marcel), "La Bibliothèque nationale suisse; son histoire, ses collections, son nouvel édifice." 42 pp. avec 35 illustr. Bibliothèque nationale, Berne, 1932.

³¹ Lemaître (Henri), "The Swiss National Library at Berne." Library Association Record, March, 1933, p. 79.

expansion is limited. However, it is hoped, in about nine years' time, to build suitable accommodation with adequate possibilities for subsequent extension, a factor which must always be allowed for where libraries are concerned. This national library is entitled by law to receive copies of all books, pamphlets, journals, and newspapers published in Poland; in addition, works published abroad in Polish, by Polish authors, or about Poland, are acquired as far as possible. All this literature is indexed, and the references are printed and published in the periodical accession lists: (i) a weekly national list of Polish publications,³² which contains about 10,000 to 12,000 entries per year, and a special one-sided edition of which is available for library purposes, (ii) a national list of newly published periodicals in Poland,³³ and (iii) a list of the works acquired from abroad³⁴ as mentioned above. The Polish section of the *Répertoire international des Traductions*³⁵ is also compiled in the library. For publications previous to the year 1928, the index of the collection is available only in bound-volume form; but from 1929 onward, it has also been compiled as a cumulative card-index on international 125 × 75 mm. cards. The book-stores are of quite modern construction, and equipped with adjustable pressed steel shelves and an electric book-lift for a load of 50 kilos. (110 lbs.). The books are shelved in four different sizes. At present there is only a small room available for the use of readers, with about 60 seats, but

³² Biblioteka Narodowa, "Urzędowy Wykaz Druków wydanych w Rzeczypospolitej Polskiej." Biblioteka Narodowa, Warszawa.

³³ Biblioteka Narodowa, "Urzędowy Wykaz Czasopism nowych, wznowionych i zawieszonych, wydawanych w Rzeczypospolitej Polskiej." Biblioteka Narodowa, Warszawa.

³⁴ Biblioteka Narodowa, "Wykaz Druków Polskich lub Polski Dotyczących wydanych Zagranicą." Biblioteka Narodowa, Warszawa.

³⁵ Published at the Institut International de Coopération Intellectuelle, 2 rue de Montpensier (Palais Royal), Paris.

it is well furnished (the tables are covered with a hard rubber composition), pleasantly decorated, and quiet. There is a remarkably fine collection of manuscripts, maps, and early prints of the seventeen hundreds, when French culture prevailed in Poland.

BIBLIOTEKA STOWARZYSZENIA TECHNIKÓW POLSKICH, WARSZAWA: This is the most important library of technical science in Poland, the work of which I was able to study in some detail thanks to the courtesy of M. Stanislas Rodowicz, the librarian. The *Association des Techniciens Polonais* was founded in 1898, and at present comprises 7000 members; about 1500 of these are resident in Warsaw, and the remainder represents the total membership of thirty local branches which the Association has formed in other industrial centres of Poland. The premises are in the rue Czacki, with a spacious conference hall, committee rooms, a restaurant, and a library. The last contains at present about 10,000 volumes of technical literature, and 100 current periodicals which are laid out in the reference room. There is an alphabetical author index on the international size cards; also a systematic index in accordance with the Brussels decimal classification,¹³ but on cards of a different size, so as to avoid possible confusion with the author index. The books are shelved in five different sizes strictly in order of accession number, a system which enables practically all available shelf space to be utilised. Readers' loan slips are filed both in order of book titles and of the borrowers' names; moreover, as the decimal classification number must be written on each slip, it is possible to keep a statistical analysis of readers' requirements in respect of subject-matter, which serves as a basis for subsequent book selection. The control mark

n each book consists of three numbers: accession, shelf, and decimal classification numbers.

It is of interest to note that the adoption of this modern system³⁶ (in place of an old-fashioned method previously used) was effected in such a simple manner that, in the transition period of two years, the ordinary work of the library could be carried on as usual. In the planned extension, to be built in the near future, it has been decided to keep all book shelves so low as to be easily reached without a ladder. The library compiles and publishes a quarterly documentation³⁷ of articles in Polish technical periodicals, about 100 of which are reviewed. Each issue contains about 600 references, all minutely classified in accordance with the decimal system, and printed on one side only of the paper; in short, ideal for international library co-operation. To cover the period immediately before the commencement of this current documentation, the library has also issued a ten-year cumulative index of Polish technical literature,³⁸ which contains: (i) an abbreviated Polish translation of the *Classification Décimale* systematic tables, (ii) an alphabetical catch-word index to the same, (iii) a systematic (decimally ordered) list of books, (iv) an alphabetical index of authors, (v) a systematic (decimally ordered) list of periodicals, and (vi) an alphabetical index of the same. I was also shown an

³⁶ Rodowicz (Stanislas), "L'organisation d'une bibliothèque modèle," 80 pp. avec 8 illustr. Varsovie, 1933. Reprinted from: Internationales Institut für Dokumentation, Vorträge der 11. Konferenz, Erster Band, 1. Neue Mainzer Strasse 47, Frankfurt-am-Main, 1932.

³⁷ Stowarzyszenie Techników Polskich w Warszawie, Sekcje Bibliograficzna, "Polska Bibliografia Techniczna." Redakcja i administracja: Allica Czackiego 5, Warszawa.

³⁸ Komitet Biblioteczny Stowarzyszenia Techników Polskich w Warszawie, "Bibliografia Polskich wydawnictw technicznych z okresu lat 1918-1928. Technika, wytwórczość, organizacja." 270 pp. Nakład Związku Polskich Zrzeszeń Technicznych, Str. 263, Warszawa, 1929.

international card-index of technical literature decimally classified, with about 70,000 cards, which had been built up within the last four years; another important documentation work compiled in the library, is the "Power and Fuel Bulletin" of Poland.

POLITECHNIKA WARSZAWSKA BIBLIOTEKA, WARSZAWA: The technical university of Warsaw was built in 1894, and at present is attended by about 7000 students. The entrance hall is in the form of a covered marble courtyard surrounded with multiple balconies, and is in fact one of the finest and most spacious assembly halls in Warsaw. The curriculum comprises public works, roads and railways, hydraulics, canals and water transport, machine construction, aerodynamics, electricity and chemistry; there is also an astronomical observatory. The *Biblioteka* contains 70,000 volumes of technical literature classified in accordance with the Brussels decimal system.¹³ Both the alphabetical author index and the systematic (decimal) subject-matter index are in loose-leaf form. Nearly 400 current technical periodicals are received. The library premises are nearly forty years old, and wooden shelves are still in use. The reference room has seats for 100 students, and there is also a separate study-room reserved for the use of professors. Glass covers are fitted on the drawers of the documentation card-index cabinets (in the same manner that I noticed in the Lenin Public Library at Moscow, see p. 125), which help to keep the cards clean.

BIBLIOTEKA PUBLICZNA, WARSZAWA: This, the "most used library in Poland," was built and donated to the State in 1913; and is now visited by about 300,000

readers in the course of a year. It is planned on American lines, and the fine classical façade is a distinctive architectural feature. The collection amounts at present to 300,000 volumes, and 2000 current periodicals are received; there is a staff of 55 librarians and attendants.³⁹ The books are indexed alphabetically under the author, and systematically in accordance with the decimal classification.¹³ The book-stores are in seven stories, and equipped with modern steel shelves. There are three rooms set apart for the use of readers; the main hall has seats for 120, the periodical room and the reference room have each 40 seats. In the reference room, with its international collection of encyclopædias, dictionaries, and other reference works, is an efficient information service. All enquiries must be written on questionnaire forms, which are subsequently filed, with the replies, for statistical purposes. There is also a special "library of librarianship" with a collection of 3000 volumes, so comprehensive that even some of the present writer's articles are to be found there (if looked for). Finally, I was shown the School of Librarianship, where students learn the use of decimal classification and so forth.

KONGELIGE VETERINÆR- OG LANDBOHØJSKOLES BIBLIOTEK, KØBENHAVN: What impressed me perhaps most of all, as I crossed this beautiful little Denmark, were the white-washed homesteads and well kept farms, which add such distinctive charm to the landscape. That the Danes are successful farmers, is due in no small measure to national education; of the special libraries maintained for this purpose, the one now under consideration is the most important, and deals also with

³⁹ Full particulars of the library's activities are published (for those who can read Polish) in its monthly bulletin: "Biuletyn Biblioteki Publicznej m. st. Warszawy." Biblioteka Publiczna, Warszawa, 1929 onward.

elated subjects such as veterinary science, forestry and horticulture. It contains at present about 95,000 volumes, with pamphlets and university theses, and an extensive collection of manuscripts.

The alphabetical and systematic subject-matter indexes have been compiled in the loose-leaf form, but will in due course be completely converted to the modern card-index system. A special numerical subject-matter classification has been adopted; the Brussels decimal system was not considered to be sufficiently minutely subdivided for the purpose of these very specialised collections. The books are shelved in accordance with the alphabetical author index, since readers have not access to the store-rooms. All volumes are bound on the premises. There are 300 periodicals laid out for open access. The loans amount to 14,000 per year, to keep check of which, the visible card-index system has proved itself indispensable.

KONGELIGE BIBLIOTEK, KØBENHAVN: This is the national library of Denmark, and perhaps the most important in the whole of Scandinavia. It was founded as a Royal Library under Frederic III in the seventeenth century, and proceeded to incorporate most of the valuable collections found in Denmark about that time: for example, from Otto Thott (the prime minister) it acquired 4000 manuscripts, and more than 6000 books printed before 1530. Two important private libraries, of the historian P. F. Suhm (about 100,000 volumes), and of Henrik Hjelmstjerne (with its valuable collection of 10,000 old Danish incunabula), were likewise added to the new Royal Library, which had already become the most complete collection of Danish national literature in existence. In the course of the nineteenth century,

due to increased book production, the library confined itself more and more to the humanities ; and when in 1924 a special commission was appointed to rationalise the scope of Danish State libraries, the Royal Library was established as the national Danish library for the humanities ; while the *Universitetsbiblioteket* (described in the next section) was entrusted with medicine and the natural sciences.

The collections of the Royal Library contain at present about 900,000 volumes, rather overcrowded on about 25,000 metres (82,000 feet) of shelves, with 30,000 manuscripts and more than 4000 incunabula ; the manuscripts include the world-famous old Icelandic parchments of the earlier Eddic poems, and the Flatœ Book which makes it clear that the Danes are to be blamed for the discovery of America, some 500 years before Columbus. Deposit copies of all Danish publications are received. About 53,000 readers visit the library in the course of a year, and some 180,000 volumes are issued to them ; external loans (for which popular fiction is not available) amount to 31,000 volumes per annum. The staff comprises 27 librarians and assistants, besides the necessary operative personnel. The library has its own book-binders' shop, and there is a complete photostat equipment on the premises.

UNIVERSITETSBIBLIOTEKET, KØBENHAVN : The history of this library can be traced back to 1482. In the year 1652 it was housed in the loft of Trinitatis Kirke, which was burnt down in 1728. When the church was rebuilt in 1731, the library was once more accommodated in the loft. In 1818 a collection on natural history was added, and in 1867 the scientific section of another library was acquired. The present University Library was built in

1861, and extended in 1907. It now contains 430,000 volumes, only a little more than half of which are Danish. The library is entitled by law to receive copies of all Danish works which are required in connection with the university studies. In addition, it purchases from abroad the most important literature on pure science and medicine.

Some volumes of the old bound manuscript alphabetical book-index were shown to me by the librarian, as examples of how an index should *not* be made. Some of the later entries, squeezed in where there was not sufficient space, were almost unreadable; while in still more hopeless cases, an asterisk had been used—and then one had to hunt for the reference! The next development had been loose-leaf binders, and finally the modern alphabetical author and subject-matter, and systematic card-indexes. The librarian, Victor Petersen, who edits a periodical documentation of medical science, had been induced to adopt the decimal classification on trial; however, he appeared to be still far from convinced of its suitability for his particular purpose. In the periodical room (*Tidsskriftlæsesal*) the recent numbers of about 350 periodicals are laid out for readers. A visible card-index is used to check the receipt of periodicals. The library is in need of additional store-room accommodation, and there are plans to build an annex outside the city in the near future.

INDUSTRIFORENINGENS BIBLIOTEK, KØBENHAVN: This is the most important technical library in Denmark, where it therefore occupies a position somewhat similar to that of the Science Museum Library, except that its scope does not include the so-called pure sciences, and it is not a State institution. The librarian is a keen

supporter of decimal classification, has applied it with excellent results to the very efficient documentation and information service maintained in his library, and has recently founded a Danish National Section for decimal classification.¹³

The Danish "Industry-union" founded this library in 1838, and since 1913-14 it has been developed into a special library and information bureau for industrial research. It contains at present about 60,000 volumes, only about a half per cent of which are Danish; and receives about 480 technical periodicals, about two per cent Danish. Most of these periodicals are indexed, and cards sent to firms who desire up-to-date documentation on the very latest technical advances. All books and periodicals are indexed alphabetically by authors, and systematically with the *Classification Décimale*. In addition, there is an exceptionally fine classified collection of patent specifications, standards, trade publications and advertisements; and a useful index of trade-marks. All volumes are bound on the premises. Photostat copies (16.5 × 29 cm.) are supplied, price 50 øre (about 6d.) each. The *Indeks for Industrien*, a current index of articles in technical periodicals compiled in the library, is published at Kr. 16 (about 15s.) per year. The staff consists of the librarian, six assistants, and the necessary operative personnel. Lack of adequate space, and the need for expansion (the librarian's *bête noire*), will in this case soon be met by the provision of an additional book-store in the spacious loft which is fortunately available.

POLYTEKNISKE LÆREANSTALT, TEKNISK BIBLIOTEK, KØBENHAVN: This is a comparatively small library of 30,000 volumes, restricted to technical science and

closely related subjects, and intended primarily for the use of students in the Technical University. The indexes are in loose-leaf binders, and the decimal classification is used for the subject-matter index. The books are shelved systematically in accordance with the main sections of the *Classification Décimale*, and then in alphabetical order within those sections. About 350 technical periodicals are received; these are not bound, but the separate issues for each year are neatly filed in covers. Each separate issue is thus available to be sent out on loan. When a reader wishes to borrow, for example, an issue of the *V.D.I. Zeitschrift*, he is not either (a) overburdened with one of the ponderous bound annual volumes, or (b) informed that it is already out on loan, *i.e.* because another reader has happened to want one of the other 51 issues in the same volume. The separate issues are sent out and returned in stout cardboard covers which afford ample protection in the post. In some cases where two copies of a periodical are kept, the second is bound in annual volumes and kept for permanent reference.

KUNSTINDUSTRIMUSEETS BIBLIOTEK, KØBENHAVN: This library, founded in 1894, is attached to the *Kunstindustrimuseum*, and constitutes the Danish special library for industrial arts. It contains at present about 15,000 volumes, and a fine collection of prints and reproductions (about 30,000 in all) from the works of Danish artists. The author and subject-matter indexes are maintained in modern card form, and to supplement them there is also a separate printed list of books on household furniture; another similar list of textile literature is now in course of preparation. About 150 current periodicals on industrial art are available for

circulation to the members on a subscription basis. The library is open from 1 to 6 p.m. for reference purposes.

DANSK FARMACEUTFORENINGS BIBLIOTEK, KØBENHAVN: The library of the Danish Pharmaceutical Society was founded in 1890, and now contains more than 5000 volumes devoted to pharmaceutical chemistry and related sciences; it is open in the afternoons, from 2 to 5 p.m. There is also a special archive for portraits of famous chemists. I was taken to see this library as an example of the ultra-modern, which it certainly is. The vehement style of decoration and brilliant colours used in the reference room may act as a mental stimulant; I involuntarily contrasted it with the sober atmosphere of the Science Museum Library. The modern Parisian craze for the use of small initial letters, even for proper names, had been carried here to the extreme; however *chic* it may appear, it is nevertheless quite incorrect to print German substantives (such as "*zeitschrift*" or "*bericht*" for example) with small initial letters.

FREDERIKSBERG KOMMUNEBIBLIOTEKER, KØBENHAVN: These public libraries use the Danish decimal classification for their systematic subject-matter indexes. This is a modified version of the Dewey scheme,⁴⁰ and its main divisions are enumerated in a recent pamphlet.⁴⁰ In addition to the systematic decimal index, there are also alphabetical author and title indexes. The books I saw were exceptionally well bound; the librarian considered the expense was well justified, because of their durability, and the fact that the public always treat a well-bound book with more respect. The object of these libraries

⁴⁰ Frederiksberg Kommunebiblioteker, "Hovedgrupperne i den af Bibliotekerne benyttede Decimal-Klassedeling med Emneliste." 8 pp. Frederiksberg (København), 1930.

is to aid the public educationally, and to supplement the work of the schools; so that the collections must necessarily contain children's books, fiction, historical and cultural works. Nevertheless I was surprised to see how relatively numerous were the scientific (and particularly the technical) books,⁴¹ which seemed to indicate a characteristic of the Danes as a practical-minded nation.

STATSBIBLIOTEKET, AARHUS: This is the third library of Denmark with a collection of about 300,000 volumes, and the only important centre for scientific research outside the capital. At the time of its formation in 1902, the duplicate copies of all Danish material in the Royal Library were incorporated, and since that date the library has received deposit copies of all books and pamphlets published in Denmark. It can, therefore, claim to possess nearly all Danish printed matter since the year 1800, as well as a considerable proportion of the earlier literature. At the outset, the State Library in Aarhus was constituted from two local libraries and three important private collections; the libraries of various local societies, as well as numerous smaller private collections, were added later. It now continues to increase with deposit copies, purchases, endowments, and receives many valuable accessions in return for duplicates sent to similar institutions both in Denmark and abroad. The library works in close connection with the scientific institutions and societies in Aarhus, and in collaboration with the *Jydske Medicinske Selskab*, has recently established a medical department.

In addition to the Danish material, a considerable

⁴¹ Frederiksberg Kommunebiblioteker, "Katalog over Faglitteratur: Praktiske Fag 60-69." 120 pp. Frederiksberg (København), 1930.

amount of valuable scientific literature is acquired from abroad. Annual lists of the latter are published, as well as numerous special subject-indexes. The staff comprises 20 librarians, besides book-binders and the necessary operative personnel. All adults resident outside the Danish capital are entitled to borrow from the library. The loans within Aarhus amount to about 25 per cent of the total (which is 63,000 volumes per annum); the remainder consist of inter-library loans, and only special and scientific literature is allowed out on this basis. A special loans scheme has also been established, under which some 270 scientific periodicals are circulated to 500 subscribers. The comfortable main hall of the library contains a reference collection of 3300 volumes; the current issues of some 250 periodicals are laid out on open shelves for the readers, who number about 27,000 in the course of a year. The newspaper collection, opened in 1918, receives deposit copies of all Danish newspapers, which are bound and placed at the disposal of the public; this collection amounts at present to about 16,000 volumes. The library serves also the new University of Aarhus, and certain sections are set apart for the use of students.

KUNGLIGA BIBLIOTEKET, STOCKHOLM: The Royal Library of Sweden dates from the early seventeenth century, and contains at present about 500,000 volumes, 12,000 manuscripts, 1,500,000 brochures and pamphlets kept in about 20,000 covers, and 200,000 copper-plates, maps, portraits, etc. In addition to the copies of all literature published in Sweden, the library acquires, as far as possible, books published by Swedish authors abroad, and books about Sweden. The books are shelved in two sizes alphabetically. The rules for the alphabetical

author index follow those of the British Museum. The subject-matter index is also alphabetical. From 1885 a Swedish union-list has been compiled in the library. The loan of books in the year 1928, for example, amounted to 23,270; in comparison with the number read in the library, which was 254,050. All books are bound on the premises. The library is built in a rather decorative style of architecture with traces of the French influence, and forms a contrast with the modern "functionalism" of the new Stockholm *Stadsbiblioteket*, for example.

Some of the theoretical principles which underlie the compilation of catch-word subject-matter indexes, have been ably discussed in a recent article,⁴² with particular reference to the new card-index intended for use of the public in the Royal Library at Stockholm. The cards are of the international standard size (125 × 75 mm.), and it comprises an alphabetical author index in addition to the alphabetical catch-word index under consideration. Björkbon defines a catch-word as "ein sprachlicher, alphabetisch leicht zu ordnender Ausdruck für den Inhalt eines Buches." In his definition lies the essential difference between a catch-word index and a systematic index. In the former, the catch-word depends directly upon the contents of the book; in the latter, the books are classed under previously determined catch-words which in all probability do not fit their subject-matter so accurately. In the Royal Library at Stockholm, the catch-words are composed of four constituent parts: (i) the main catch-word which classifies the book, and is modified by the other three, (ii) the subsidiary, which qualifies the above, (iii) the temporal, which can be specified either as a date or a period of history, and (iv)

⁴² Björkbon (Carl), "Der Schlagwortkatalog der Königlichen Bibliothek in Stockholm." *Zentralblatt für Bibliothekswesen*, Jahr. 49, Heft 1-2 (Jan.-Febr., 1932), p. 56.

the formal, which specifies the subjective aspect, *i.e.* whether the work is a periodical, collection, handbook, map, etc. For the main catch-word, it is considered preferable to use *one* word whenever possible. Generally it is not a difficult matter to express the subject-matter of a book in one word.⁴³ To select the *mot juste* as catch-word for an index, is an art, and no hard-and-fast rules can be laid down. As Björkbom points out "*es ist eine Kunst, das passendste Wort zu finden.*" At least, rules for the compilation of such indexes, should not be too slavishly followed. It is, of course, necessary to "follow the tramlines" to a certain extent; but experience shows that since it is practically impossible to formulate universal cast-iron rules, these have to be modified when common-sense requires.

TEKNISKA HÖGSKOLANS BIBLIOTEK, STOCKHOLM: The most important technical library at Stockholm is housed in modern premises⁴⁴ which were completed in 1930. The *Bokförråd* (book-store) with 69,000 volumes, occupies four floors with possible subsequent extension in the roof, and is provided with an electric lift. The construction is of reinforced concrete, completely fire-proof. The spacious reference room has seats for 66 students; there is also a smaller room with 12 seats; and a number of private studies are also available on the first floor. The librarian, Fröken Hilda S. Lindstedt, showed me over the entire establishment, and explained her methods in detail. She suffered with lack of adequate staff, and

⁴³ This should be child's play in German, when one can construct such words as: *Gesundheitswiederherstellungsmittelszusammenmischungsverhältniskundiger*. Such monstrosities can, however, be dissected with a little patience; for example, we have here a "health-restoration-means-mixture-proportion-expert" or, in short, a chemist.

⁴⁴ Lindstedt (Hilda S.), "Tekniska Högskolans nya Bibliotek." *Särtryck ur Teknisk Tidskrift* 1931, häfte 7 och 9.

did all the intellectual work of the library herself with but occasional voluntary assistance. She had visited several technical libraries in the U.S.A., and had adopted American methods. The books were shelved in broad systematic sections, within which the accession numbers were used to locate them. Miss Lindstedt was not in favour of either the Dewey or the Brussels decimal classification. A committee of nine professors decided what new books were to be purchased for the library. All volumes were bound on the premises. The number of readers amounted to about 75 daily in term-time. More than 1000 current periodicals on pure and technical science were received.

STADSBIBLIOTEKET, STOCKHOLM: The quite new municipal library is a remarkable piece of architecture in the simple disciplined lines of the Swedish neo-classical style. The dominant feature is the lofty rotunda, around the inside walls of which 50,000 volumes are shelved in three circular tiers. The public have free access to the lowest (at floor level); the second and third tiers are set back in increased diameters, to provide for the necessary balconies. The card-index contains authors, subjects and titles, all mixed up in one common alphabet, after the American fashion. Around the central rotunda are symmetrically disposed the reference rooms, with their diversified schemes of decoration. There is a White Room, a Yellow Room and a Red Room; and a number of smaller rooms for lectures, and for societies or clubs to meet in. About 800 periodicals and newspapers are received, and laid out on inclined shelves for open access to the public.

In most Scandinavian scientific libraries, works in the vernacular are in the minority; in this public library,

I was therefore surprised to hear that 85 per cent of the collections were in Swedish, and not more than 3 to 4 per cent in German, for example. In the children's department, which is beautifully decorated and furnished with miniature chairs, tables and book-shelves, there is the remarkable Story-Teller's Room. Seats for 50 children are set out in semi-circular rows in front of a recess, in which the story-teller sits and talks about fairies and "trolls" for an hour every afternoon. The walls are decorated with all kinds of fantasies, and the roof is an enormous umbrella.

UNIVERSITETSBIBLIOTEKET, OSLO : This library serves simultaneously three functions: those of university library, national library, and municipal library. The staff consists of 13 librarians, 5 assistants, and 8 students of librarianship; the total personnel amounts to about 60 inclusive. This, the third structure, was planned in 1907 and completed (as it stands at present) in 1913. It covers an area of 2120 square metres (22,800 sq. ft.), and has a content of 36,160 cubic metres (1,277,000 cub. ft.). The book-store is in seven floors of fire-proof construction, and contains at present more than 800,000 volumes. The limits of its shelf capacity have now been nearly reached, and an extension is now planned to accommodate at least 50 per cent increase.

When the planned developments⁴⁵ are completed, there is to be a cloakroom for 350 visitors; the reference room will seat 250 readers, and there will be 1600 periodicals laid out for open access. Private studies and conference rooms will also be provided; and there are to be separate manuscript, folklore and music depart-

⁴⁵ Munthe (Wilhelm), "Universitetsbibliotekets Utbygning; en Utredning ved Overbibliotekaren." 39 pp. Særtrykk av Universitetsbibliotekets Årsberetning 1928-29. Oslo, 1930.

ments, with sound-proof accommodation to enable visitors to play the music over. One most attractive feature which I noticed was the Björnson Room, furnished and decorated in the period, and dedicated to Norway's famous writer. There are the usual alphabetical author and subject-matter indexes (decimal classification has not yet been adopted in Norway to the extent which it deserves). All volumes are bound, and all index-cards and similar small work is printed, on the premises. The library has its own photostat and *Adrema* equipment; an all-electric kitchen and luncheon-room are also provided for the librarians and assistants.

YLIOPISTON KIRJASTO, HELSINKI: The library is housed in a separate block adjacent to the University. The structure is more than a century old, built in the classical style, and beautifully decorated inside. It serves the dual function of both university and national library; from the year 1919 onward, five copies of every book or pamphlet printed in Finland must by law be deposited before publication. One copy of each is retained, and the remainder are distributed to other State libraries in Finland. The library also endeavours to acquire, as far as possible, copies of all books published in other countries by Finnish authors, translations of Finnish works, and publications relative to Finland. All this and other literature received from abroad, has an alphabetical author index in the old-fashioned book form; the Finnish portion of the collection is, however, provided with an alphabetical author card-index of international size.

The books are shelved systematically in broad sections, within which they are located by accession number; the present book-store is now nearly filled, and an

extension is planned for the near future. In the more recent portion, about thirty years old, the book-stacks are set out radially, which is economical for illumination but wasteful of valuable space. The subject-matter classification scheme, which is used solely in order to shelve the books, has 27 main classes with about 270 sub-divisions in all. With reference to the use of Swedish in Finland, I was told that only about 10 per cent. of the present collection is in Swedish, and in new accessions even this small proportion is on the decline. The entrance hall contains the loans administration. The main hall has seats for about 75 readers, but the librarian, Dr. L. Tudeer, informed me that accommodation for 300 was really needed. There is also a small reference room and information bureau, and an unusually fine collection of mediæval manuscripts. The various departments of the library can be isolated with fire-proof steel doors. From the year 1929 onward, a Finnish union-list of publications received from abroad has been compiled with the collaboration of the fourteen most important libraries in Finland. The method follows more or less the lines of the German *Instruktionen*¹⁹; publications of corporate bodies, etc., are entered directly under their titles, but cross-referenced under the town names.

SUOMEN TEKNIILLISEN KORKEAKOULUN KIRJASTO, HELSINKI: The library of the Finnish Technical University is, almost needless to mention, the most important technical library in Finland. It contains 60,000 volumes and pamphlets, and is open to the public six hours per day, namely from 12 to 4 p.m. and from 6 to 8 p.m. It is used principally by students of the technical university, for whom the loans department is also open from 12 to 3 p.m. daily. The library receives

a comparatively extensive collection of current technical periodicals,⁴⁶ 300 of which, with technical dictionaries and similar reference works, are placed at the immediate disposal of readers. The subject-matter classification for the books is a system with (i) Roman numerals up to XVII for the main sections, which are further subdivided by the use of (ii) capital letters, (iii) ordinary numbers, and then, in a few cases, (iv) small letters. In short, a rather complex system, with nearly a hundred sub-divisions in all. There is an alphabetical author card-index; but the cards are *not* of international size, which may prove unfortunate when collaboration with other libraries is involved. The accession lists⁴⁷ have been printed and published from the year 1911 up to date. In these, the entries are printed in alphabetical order within their subject-matter sections. The index cards for new accessions are also filed in this manner until the end of each current year, when the accession list is printed from them, and they are then intercalated into the cumulative alphabetical author card-index.

At present, in order to find a book by subject-matter, it is necessary to search in the various bound volumes of the accession lists; however, the librarian, Dr. A. Kemiläinen, told me that it is hoped to set up a subject-matter catch-word index of the whole collection as soon as pressure of other work permits. As there are also seven auxiliary reference libraries in the various departments of the technical university, and only three librarians for the whole administration, much of the work must be handicapped. The books are shelved systematically, and then alphabetically under the authors within the

⁴⁶ Suomen Teknillisen Korkeakoulun Kirjasto, "Aikakausjulkaisujen Luettelo." Helsinki, 1928.

⁴⁷ Suomen Teknillisen Korkeakoulun Kirjasto, "Lisäluettelo." Helsinki, 1911 onward.

various sections. It is, however, intended to shelve by accession number in the near future, since this latter method is much more economical of shelf space. In this manner, space for ten more years' accessions will be won.

EDUSKUNNAN KIRJASTO, HELSINKI: The Parliament House, completed in 1931, a work of the architect J. S. Sirén, is representative of the simple, disciplined lines of the neo-classical style in Finland. It stands on an elevation, which makes the façade of pale rose-coloured stone remarkably impressive. The entrance hall, decorated with marble of different colours, is of fine layout and workmanship. The library is specialised for political science, and the equipment is all quite modern. It is open for use of the public, and contains 100,000 volumes which are shelved systematically on pressed steel book-stacks. The parliamentary papers of twenty countries are received. The whole collection is provided with an alphabetical author index and a systematic index, the cards of which are international size. The subject-matter classification uses Roman numerals up to XXIII for the main sections, most of which are sub-divided by ordinary numbers, and in some cases still further by the use of small letters. For example: XVIII Statistics; XVIII.1 Theory of statistics; XVIII.2 Official statistics; XVIII.2.a Official statistics of Finland; XVIII.2.b Official statistics of Sweden, Norway, Denmark; XVIII.2.c Official statistics of other countries. A key to the complete system is published in the library accession lists, systematically compiled, but within each subdivision the entries are in alphabetical order. In addition to the systematic portion of each list, there is a full alphabetical author index and an alphabetical subject-

matter index to the classification scheme. The printed accession list⁴⁸ of 1926-28, for example, is a volume of 460 double-sided sheets. The main hall of the library has seats for 45 readers; books are also allowed out on loan for a period of one month.

⁴⁸ Eduskunnan Kirjasto, "Luettelo." Eduskunnan Kirjasto, Helsinki.

CHAPTER V

LIBRARIES OF SOVIET RUSSIA

THE first impression of Soviet Russia was a view of the frontier, about half a kilometre ahead, while I waited at Rajajoki, the last railway station in Finland, for the Russian train (two coaches and a small locomotive) which was to take me over the frontier into this land of adventure. I write *me*, because I was to be the one and only tourist to cross the frontier that day. A monstrous red tower decorated with red banners, a sort of *arc de triomphe* which spanned the railway track, loomed up ominously in the distance. Not only in London, but also in Sweden and Finland, I had been warned to expect semi-starvation with all sorts of ill-treatment and horrors. In due course, the little train made its appearance; the one and only tourist stepped in, and was taken under the red archway into Red Russia. At the frontier station of Belo-Ostrov, I was met by a representative of Intourist, the Soviet State Tourist Company, which not only provided so well for my personal comfort that I was relieved of absolutely all trouble on that account, but also rendered every possible assistance in connection with my special visits to scientific libraries.

When one reviews present conditions in the Soviet Union, it must be borne in mind that this vast country and its heroic people (for I very soon came to respect them as such) are still in the throes of industrial reconstruction, such as that exemplified in the *Scharikopod-*

shipnik works at Moscow, or the automobile works at Gorki⁴⁹; all educational development must be directed toward this work for the Plan, and hence we find in the Russian libraries a preponderance of technical science over all other studies. The fine arts are not much in demand; while some forms of literature, such as the so-called "counter-revolutionary" and that in favour of the church, have even been suppressed. On the other hand, communist and anti-church material is welcomed; the latter is but a natural reaction from former conditions in priest-ridden "Holy Russia" whose churches and cathedrals are now used as warehouses or museums; church worship is neither forbidden nor supported, but in actual fact, these Soviet people appear to worship science instead⁵⁰.

Books on science (and communism) therefore dominate their libraries, so that I did not consider it necessary to head this chapter: *Scientific* libraries of Soviet Russia. The educational movement in which these libraries form such a vital factor, assumes fantastic proportions when considered in calm retrospect, here in conservative London; but out there, in that land of fresh ideals, bold experiments and heroic achievements, this Londoner must have become Soviet-minded. I was told that every worker is entitled to a university education; and it appeared to me that every worker availed himself (or herself) of it with enthusiasm. I noticed these serious-faced worker-students busy with their text-books, not only in the libraries, but in the public parks, and even in the crowded street-cars (these were crowded with

⁴⁹ Janua Spratt (H. Philip), "Technical work in the U.S.S.R." Russia To-day, 1935, p. 12. Friends of the Soviet Union, London.
⁵⁰ Spry, 1935, p. 12. Friends of the Soviet Union, London.
 of Sovieratt (H. Philip), "Vpechatleniya o Sovetskoi Rossii (Impressions 1935, p. 6. Russia)." British Russian Gazette and Trade Outlook, January, 1935.

Russians, inside and outside, on the steps and buffers). The chauffeur who drove me was one of these worker-students; once on our return to the car, I found him immersed in a book, and a peep over his shoulder surprised me: it was *not* a novel, but a text-book on mathematics of the more repulsive kind. Such is the vehement nature of university education in the Soviet Union, and such are the readers whom the libraries have the real honour to serve.

Most of the libraries which I visited were well staffed, and maintained excellent documentation and information services. The librarians appeared to be keen on their work, but not so self-conscious about it as the Americans (who will be dealt with in the next chapter). Librarianship was not taken too seriously for its own sake, and no so-called "special" qualifications were required for admission to the profession. Applicants were, however, required to understand American, German or French in addition to their Russian (which alone has about 96 distinct dialects), and were expected to attend the university courses in librarianship. The standard of their intellectual work is the more to be admired, when one considers the difficult material conditions under which our Russian *confrères* are at present handicapped.

Most of the libraries are still housed in beautiful but unpractical old palaces which have fallen into sad disrepair since the Revolution; the equipment was often primitive, and in some cases I saw timber racks used as shelves for the overflow of mushroom collections; the books (that is, the Russian ones) were printed on inferior paper and ill bound. But this is a land of reconstruction: hundreds of modern libraries are in course of erection; the new Lenin Public Library in Moscow, when completed, will show us the last word in

equipment ; there is already an improvement in Russian paper, and no doubt the *Kniznaya Palata* will soon have better card material on which to print its excellent documentation service (described on p. 122).

As we enter these Soviet libraries, we shall notice first a red-draped portrait of Lenin, and then a red-draped portrait of Stalin ; we shall have to accustom ourselves to these red-draped portraits, lest their overabundance should prove tiresome.

BIBLIOTEKA UNIVERSITETA, LENINGRAD : The old capital of the Tsars is not a town of slow historical development like Moscow, but was built in the course of the last two centuries, to a co-ordinated artistic plan from the start. The best architects of Europe collaborated, and the result has been a harmonious architectural *ensemble* such as one finds also in Paris ; there are broad boulevards like the old Nevski Prospect, wide open squares and stately old structures, such as the Academy of Science and the Winter Palace (with its superb collection of Rembrandts) on the fine broad banks of the Neva. This is surely one of the most beautiful cities of northern Europe, and constitutes the scientific centre of modern Soviet Russia ; one feels here the throb of industrial enterprise and optimism. As already mentioned, every worker is here entitled to a university education, and the State also provides the necessary books. As a result, the university libraries often have to obtain some hundred or more copies of one particular text-book, and most of them have thus become " snowed-under " with a vast accumulation which their book-stacks were never intended to accommodate.

Here the University Library is said to contain more than a million volumes ; these are classified in accordance

with a similar scheme to that used in the *Universitätsbibliothek* at Berlin (see p. 77), and then shelved in order of accession number within each broad division of the subject classification. This library specialises on natural history and the humanities, and collaborates with the library at the Academy of Science, in order to avoid duplication wherever possible; for example, no medical books are taken, because such are available at the Academy of Science. Extensive inter-library loans are made with American, German and French universities (but not with our own, it appeared, for some reason); in addition, some thousands of duplicates and "throw-outs" have been despatched to various universities abroad, in return for other desirable material. In term-time, the main library is open from 9.30 a.m. to 11 p.m. in winter, and from 12 to 6 p.m. in summer. The university has also 65 departmental libraries in the various faculties.

PUBLICHNAYA BIBLIOTEKA, LENINGRAD: This is one of the most important public libraries in the Soviet Union, second only to the Lenin Public Library in Moscow (which is described on p. 123). It is housed in a palatial old structure, such as abound in the architectural wealth of this miniature Paris, but have for the most part fallen into sad disrepair since the Revolution. As behoves such an important public municipal library, the location is central, on the old Nevski Prospect (about three minutes' walk from the enormous Europe Hotel in which Intourist made me so comfortable). The collections are said to contain about 5,000,000 volumes, but no doubt many of them are duplicate copies; in addition, there are six small branches scattered about the suburban districts, near the new workers' settlements.

This central library consists of two main departments, the Ancient and the Modern. The former contains a superb collection of ancient manuscripts; there are some 50,000 specimens in all, most of them Slavonic; the remainder include some of the earliest Hebrew and Samaritan manuscripts in existence, and other priceless biblical documents. In the Modern department, we find an abundance (even an *over*-abundance) of books on social and industrial reconstruction, and what wonders have been accomplished under the successive Five-year Plans. This material is classified in accordance with the Marxian scheme, which threatens to force itself on most Russian libraries in the near future. This is an unreasonable classification, in which most of the material is so distorted as to show a fantastic contrast between capitalism and communism, and all sense of proportion is therefore lost.

In the book-stacks, periodicals are not separated from other publications such as text-books, but are shelved in the same subject order; obsolete periodicals or those in less frequent demand, are dumped in a basement store. A set of the L.C. printed cards is maintained for reference purposes; there is also an efficient information bureau, and a photostat machine is kept on the premises for the reproduction of manuscripts and articles needed for research work. The staff consists of about 350 librarians and assistants. In the winter, the central library is open twelve hours daily from 11 a.m. to 11 p.m., but in the summer months its activities are reduced somewhat. The six branches mentioned above include a children's department, an archives collection, special libraries for popular science and western art, and (last but not least) an anti-church department. Each branch has a staff of about six to ten librarians.

TZENTRALNAYA BIBLIOTEKA TRANSPORTA, LENIN-GRAD: This library is housed in the Institute for Railroad Transport, and is intended primarily for the use of professors and students. It was founded in 1810, and contains at present more than 158,000 volumes on railway transport and related subjects. For the first fifteen years of its existence, the collection had consisted mostly of French works; now, however, it has developed on quite international lines. Of the current technical periodicals received, 150 are Russian and 92 come from abroad; many of the sets are complete from the first issue. The current numbers are laid out on racks for open access in the reference room, which has accommodation for nearly a hundred readers.

The book-stores are of fireproof reinforced concrete construction, with steel shelves, book-lift, and the inevitable double windows. The books are shelved strictly by accession number in various sizes. There are alphabetical author and subject-matter card-indexes; in the former, the Russian part of the collection is indexed separately, on account of the different alphabet. The cards are of standard international size. It is of interest to mention that, in more than a hundred years, there have been only four successive librarians. As the dusk fell, I boarded the Red Arrow, the crack train of the Soviet railroads, which was to take me on to Moscow.

BIBLIOTEKA UNIVERSITETA, MOSKVA: To experience the full flavour of modern Russian life, it is necessary to visit Moscow. This is a town of slow and historical development, with narrow crooked streets just the same as London. There is contrast: colour and shadow, much that is beautiful and much that is not. At the

centre of the metropolis, in Gorki Street, the construction of a new Intourist hotel (a colossal skeleton in reinforced concrete) proclaims the ambitious spirit of the modern Soviet Union; at a stone's throw, one finds contrast in the ancient Red Square (scrupulously well kept), the beautiful old Kremlin, and the fantastic little cathedral of Saint Basil. Just in front of the Kremlin Wall stands the Mausoleum of Lenin, massive and austere. The sunset behind the spires of the Kremlin and the onion-like domes of Saint Basil, is a view I shall always remember. The university was almost overcrowded (like a bee-hive) with men and women students whose earnestness impressed me; there were mixed classes, in accordance with modern "co-educational" principles.

The library is housed in a smaller, but no less palatial, structure than the Lenin Public Library (described on p. 123), and is quite separate from the university itself. The collections amount to about 550,000 volumes, but no doubt many of these are duplicate copies. The author index is in two distinct parts, one for the Russian alphabet, and the other for the Latin. The subject-matter index is based on an old "die-hard" German classification, invented in 1826 and quite inadequate for modern requirements. In the near future, however, the Marxian scheme (mentioned also on p. 118) will perhaps be substituted, as the lesser of two evils. The staff consists of 72 librarians and assistants, whose official hours are from 9 a.m. to 4 p.m. The main hall of the library, however, remains open for the use of readers until 10 p.m. daily, and is crowded most of the time.

BIBLIOTEKA INSTITUTA INZENEROV TRANSPORTA,
Moskva: The library of the Institute for Railroad

Transport contains 300,000 volumes (not titles); numerous copies of the more important works prescribed for the diploma course, must be available for loan to the students. The alphabetical author index is in two sections, since the Russian entries must be filed in a separate alphabet; there is also an alphabetical catchword subject-matter index, the cards of which are the international standard size, 125 × 75 mm. The bookstores have not yet been modernised, and wooden shelves are still in use. The books are shelved systematically in subject order, and located by accession number within the various subject-matter sections. The main hall of the library has seats for about 250 readers, and is intended primarily for the use of professors and students of the Institute.

GOSUDARSTVENNAYA TSENTRALNAYA KNIZNAYA PALATA, MOSKVA: The central Book-chamber of the Soviet Union, housed in an old summer palace on the Novinskii Boulevard, cannot be described as a library in the usual sense, because it has no accommodation for readers, neither are any books allowed out on loan; nevertheless, its activities are of special interest to students of librarianship.⁵¹ The central *Kniznaya Palata* is authorised to receive, before publication, 45 copies of every book or pamphlet printed in the Soviet Union (and these number about 50,000 per annum). One of each is retained, shelved here for three years, and then packed in bundles and stored in the Lenin Public Library (described in the next section); the remainder are distributed to other Soviet State libraries. It is of interest to note that there are 96 distinct dialects

⁵¹ For further particulars, reference should be made to the pamphlet: Schamurin (E. I.), "Gosudarstvennaya Tsentralnaya Kniznaya Palata RSFSR, vzniknovenie i deyatelnost." 54 pp. Moskva, 1930.

in the Russian Socialist Federative Soviet Republic (RSFSR).

From the year 1907, the Palata has issued the *Kniznaya Letopis*, the official weekly list ⁵² of Russian publications (weekly in the Soviet sense of six days). This national index, probably one of the best examples of its kind in existence, is classified in accordance with subject-matter into main sections, numbered with Roman numerals up to XVIII. Within these sections, the entries are in alphabetical order, and each is classified on the Brussels decimal system. In a recent article, ⁵³ Dr. Joris Vorstius also praises the *Kniznaya Letopis* because of the accuracy and completeness of its references, the fact that articles of different authors which are published as a collection or series in the same volume under a common title (called "Sbornik statej" in Russian) are each referenced separately in addition to their common title reference, and that *Classification Décimale* numbers are provided to all references quoted therein. A special edition for library use, printed on one side only of the paper, is now published; the *Kniznaya Letopis* is also available in card-index form, each reference on a separate card of the international standard size, 125 × 75 mm. What an enormous waste of scissors-and-paste work would be saved in libraries all over the world, if other national indexes were also immediately available in international card form. The circulation of the *Kniznaya Letopis* in pamphlet form is 2250 copies, and in card-index form 1000 copies, so that there is evidently adequate demand for the latter. For the past three years, the Palata has

⁵² Gosudarstvennaya Tsentralnaya Kniznaya Palata, "Kniznaya Letopis," organ gosudarstvennoi bibliografii, vukhodit kazhduie 6 dnei. Moskva, 1907 onward.

⁵³ Vorstius (Dr. Joris), "Zur Theorie der primären Nationalbibliographie." Zentralblatt für Bibliothekswesen, Jahr. 47, Heft 7 (Juli, 1930), p. 323.

also published quarterly lists of (i) maps, (ii) music,⁵⁴ and (iii) printed art, such as portraits, picture post-cards, illustrated placards. These have each a circulation of about 1000 copies. There is also a bi-monthly list of the more important articles in periodicals⁵⁵ published since the Revolution, an annual list of newspapers and journals,⁵⁶ and an annual statistical review of the previous year's production of printed matter.⁵⁷ All these publications of the *Kniznaya Palata* are printed and bound on the premises; seventeen compositors and six apprentices are employed, all the print is hand-set, and there are three presses. For internal use, there is an exceptionally comprehensive collection of the world's national book-lists (Publishers' Circular, etc.), and a library of 30,000 books about books. For a most courteous reception, the writer's thanks are due to Mr. V. I. Soloviev, director of the Palata.

PUBLICHNAYA BIBLIOTEKA IMENI V. I. LENINA, MOSKVA: This, the most important public library in the Soviet Union, is centrally situated in Moscow, about five minutes' walk from the Red Square and the Kremlin. The present structure dates from the seventeen-hundreds, and was formerly known as the Rumjancev Museum Library which contained the library proper, and the departments of manuscripts, antiquities and art. The antiquities were moved to the historical museum, and

⁵⁴ Gosudarstvennaya Tsentralnaya Kniznaya Palata, "Notnaya Letopis," organ gosudarstvennoi bibliografii, vukhodit 4 raza v god. Moskva, 1931 onward.

⁵⁵ Gosudarstvennaya Tsentralnaya Kniznaya Palata, "Zhurnalnaya Letopis," organ gosudarstvennoi bibliografii, vukhodit 2 raza v mesyatz Moskva, 1926 onward.

⁵⁶ Gosudarstvennaya Tsentralnaya Kniznaya Palata, "Spisok Periodicheskikh Izdaniy RSFSR v 1933 G. (na 1 Iyulya)." 482 pp. Moskva, 1933.

⁵⁷ Gosudarstvennaya Tsentralnaya Kniznaya Palata, "Pechat RSFSR v 1932 Godu, statisticheskie materialui." 178 pp. Moskva, 1933.

other alterations were made in order to provide more space for the library proper. Since 1917 the department of manuscripts has trebled in size, and a "museum of the book" has been added to it. A special Tolstoi room has been maintained since 1925, and there the standard edition of his works has been prepared. Another room is devoted to a permanent exhibition of Anton Tchekhov and his contemporaries, and in 1928 a Gorki room was added. When the library is in the near future transferred to modern premises, the present structure will be used as a literature museum. The collections now amount to about 5,000,000 volumes, many of which are, however, duplicate copies. The library is entitled by law to receive two copies of every book or pamphlet published in the Soviet Union.

Since the year 1927, the alphabetical author index for Russian books has been compiled with the help of printed references from the *Kniznaya Letopis* published by the Kniznaya Palata (described on p. 121). These references (which are all classified in accordance with the *Classification Décimale Universelle*) are filed on index cards of the standard international size, 125 × 75 mm. Alphabetical author references for the remainder (*i.e.* other than Russian) must, of course, be filed separately. There is a numerical systematic subject-matter index for all the literature; and, since the year 1931, an alphabetical subject-matter index for the Russian books has also been compiled. The indexes are made in two copies, one for use of the public, and the other for internal library use. There is a well equipped bookbinders' shop on the premises, in which twelve workmen are employed. The books are shelved in different sizes by accession number. Most of the shelves are, of course, old-fashioned and built of wood; from the year

1925, however, modern steel shelves have been installed. The library receives 10,000 newspapers, 2000 current Soviet periodicals, and 14,000 more from abroad. It is open to the public twelve hours daily (except for only five days in the year), from 10.30 a.m. to 10.30 p.m. The main hall has seats for 450 readers, and the two smaller rooms (for special literature and science) have accommodation for 50 readers each. The library is visited by about 1500 readers daily, and a comfortable rest room with buffet is provided for their use. More than a million books are issued to readers in the course of a year. The staff consists of 300 librarians and 250 operatives. For each post which involves public service, two and a half officers are provided. There is an efficient information bureau to deal with special enquiries. The library works in close collaboration with the *Preussische Staatsbibliothek* (see p. 73) for reciprocal loans service. Glass covers are fitted to all drawers of the index cabinets for public use ; these help to keep the cards clean. Readers' requisitions are dealt with in strict rotation but, due to the heavy demand, nearly an hour's delay must often occur before the books can be supplied, even when the shelf number is stated on the requisition. Readers' tickets cost the nominal sum of 2 roubles per annum.

Work on the new library premises should be well advanced in 1936 ; it will be a fine example of austere modern Soviet architecture. There is to be accommodation for 1000 readers (instead of 550 as at present), and special rooms for scientific research. The book-stacks will be built for 7,000,000 volumes. All internal transport will be entirely mechanised, and the equipment is to be the last word in modern technique.

PUBLICHNAYA BIBLIOTEKA, NIZHNI-NOVGOROD : A visit to this ancient town, which now rejoices under the name of " Gorki " but has not yet been unduly modernised in other respects, was well worth the special journey out from Moscow. Some of the charm of old Russia still remains here, and the repose of the river and open country-side provided a welcome relaxation for this strenuous tourist. The Public Library is said to contain more than a million volumes ; and, like the Lenin Public Library described above, it is open to the public twelve hours daily, but from 10 a.m. to 10 p.m. Most of the collections appeared to be devoted to science, and the Dewey decimal classification⁵ is used. This caused me no little surprise, in view of the fact that the official list of Soviet publications⁵² is classified with the Brussels extension¹³ of that scheme, which has proved itself so efficient for scientific and technical literature in the Science Museum Library at London. The loan of books was almost confined to non-fiction ; the Soviet Union is a nation of serious-minded readers.

BIBLIOTEKA UNIVERSITETA, NIZHNI-NOVGOROD : The university here comprises several different institutes, of which the most important is the Chemical Institute. Formerly each of these institutes maintained its own departmental library, but it was later decided to co-ordinate their activities under one roof ; this central University Library was constructed for that purpose, and opened in 1931. It is a well-planned structure, and contains at present more than 200,000 volumes, most of which are on scientific subjects. So far, there is only an alphabetical author index to the collection ; but it has been realised that a subject-matter index is essential for scientific research, and such is now in active course of

compilation. The books are shelved in order of accession number, irrespective of subject; a method which has become popular in continental libraries, since it economises space⁵⁸ and is no drawback where readers are not allowed open access to the shelves. There were only about a dozen on the library staff, but comfortable modern accommodation was provided for them.

So this little Russian tour of mine came to a close; I turned towards the west, meandered across Europe back to London, and started to think about the New World where I was to pursue this matter of scientific librarianship.

⁵⁸ This method has been adopted with conspicuous success in the Biblioteka Stowarzyszenia Techników Polskich at Warsaw, as described on p. 92.

CHAPTER VI

SCIENTIFIC LIBRARIANSHIP IN THE NEW WORLD

WHAT impressed me perhaps most of all about librarianship in the New World, was its efficient standardisation; in the details of their technique and internal administration, most American libraries appear to be as alike as peas. There are several reasons for this. Librarianship has become a standardised and self-conscious profession in America, thanks to the activities of the American Library Association and the Special Libraries Association (to be described later). Wide distribution of the famous L. C. printed cards,⁵⁹ with reference data accurately compiled once and for all, not only eliminates a wasteful repetition of expert work, but also helps to maintain an efficient uniform system in American library card-indexes (which are almost invariably of the "dictionary" form); the recent adoption of the Dewey decimal classification⁶ for L. C. printed cards has also proved to be another valuable influence toward standardisation in scientific documentation. And, last but not least, American libraries are in most cases staffed with the standardised product of the library-schools, a form of institution which has not yet been developed to the same extent in Europe.

On the whole it can, I think, be said that American libraries are better staffed than ours; better in the quantitative sense at least. As to the qualitative aspect,

⁵⁹ Hastings (Charles H.), "L. C. printed cards: how to order and use them." 38 pp. illustrated. Library of Congress (Card Division), Washington, 1925.

I would not venture to make comparisons, either favourable or unfavourable, between American and British librarians. The efficient standardised factotum of American librarianship appears to be somehow different in temperament from the self-reliant specialist to be found in most of our British scientific libraries. He or she (in America it is more often the latter) is an expert manipulator of card-indexes and vertical files, trained to accept librarianship as a profession, an ultimate aim in life. Whether the card-index happened to contain material on the fine arts or on scientific research, would be quite a minor consideration.

In spite of all this super-efficient American librarianship, however, there are certain details of our work which are done better in this old-fashioned European continent. For example, I would mention the co-operative use and expansion of decimal classification. The value of such a classification depends in no small measure upon the number of librarians who co-operate to use it (the more, the merrier); universal adoption leads to possibilities of beneficial co-operation all round, even in a discordant continent such as Europe. The widespread *Classification Décimale Universelle*¹³ is here under the control of an International Commission, to which all proposed extensions must first be submitted with a view to their co-ordination. Periodical lists are then circulated to members for their criticism within a certain specified period. Extensions and modifications which receive final approval are issued in loose-leaf form⁶⁰ to all users of the classification, who are thus kept *au fait* with new developments; universal concordance

¹³ Classification Decimalis, Supplementa et Correctiones. Comprend environ 7000 extensions, sous forme de feuilles mobiles. 378 pp. Commission Internationale de la Classification Décimale, Willem Witsenplein 6, La Haye (Hollande). 1933.

and co-operation⁶¹ is thus assured, to the ultimate benefit of all concerned. But what a sad contrast we find in the United States, due to lack of adequate disciplined co-operation. Many so-called "users" of the Dewey decimal classification⁵ appear to take the law into their own hands, and to introduce home-made extensions or even modifications at will, and without the least effort towards co-operation with others. Now this is not fair treatment for a classification whose full value cannot be appreciated except under the European conditions of co-operative utilisation described above; it must be *adopted* and not adapted.

Apart from the John Crerar Library (described on p. 186) and a few other exceptions, most of the important scientific collections in the United States appear to be developed either (i) as departments of the public libraries, or branch collections attached to the faculties of the universities, or (ii) as specialised industrial or research libraries, such as those which form the membership of the Special Libraries Association (see p. 131). The former, so far as the public libraries are concerned, would come under the administration of a departmental staff well trained in librarianship (if not in science); while at the universities there are, more often than not, scientific brains at the helm. The latter (ii) are, for the most part, each maintained for the use of specialists on the staff of a particular industrial concern, and not available to the public; the information service here constitutes the most important aspect of their work, and calls for librarians who are (or should be) scientific experts at the same time.

⁶¹ Without international co-operation, such vast documentation resources as those at the *Palais Mondial* in Brussels (see p. 69), and at the Science Museum Library in London (see p. 24), could never have been accomplished.

With reference to the architectural aspect of public libraries in the New World, these palatial modern structures ⁶² built with American dollars, on a luxurious scale not often to be found in Europe, are more like temples than mere "places set apart to contain books." The manifestation of super-abundant wealth is apt to produce sad architectural results if untrammelled with due respect for tradition, but the writer found such lapses of the *nouveaux riches* to be but the rare exceptions which proved the otherwise consistent level of taste and decorum in the architecture of American libraries.

PART I

SPECIAL LIBRARIES ASSOCIATION, NEW YORK: The headquarters (at 345 Hudson Street) are located "down-town" in Manhattan, at a fair altitude. This association has for its objectives: to promote the collection, documentation and dissemination of information, to develop the usefulness and efficiency of special libraries for research, and to advance the professional welfare of its members, who at present number about 1850 in all. Membership is of three kinds: (i) institutional membership for those which maintain special libraries and require wide connections; the Association places at the disposal of their librarians an informal advisory service in matters of administration, (ii) active membership for librarians and senior assistants, to put them into contact with the entire special library field, and to provide a medium for their professional advancement; and (iii) associate membership for novices and those about to

⁶² See also: Munthe (Wilhelm), "Die neuesten amerikanischen Bibliotheksbauten." Zentralblatt für Bibliothekswesen, Jahr. 48 (1931), p. 447.

enter special library work, to provide them with an introduction to its many phases.

In addition to its New York headquarters, the Association comprises 13 local branches or "chapters" in the principal industrial towns of both the United States and Canada. For consideration of common problems which arise in specialised librarianship, the Association is also divided into ten technical fields, such as : commerce, financial, museum, newspaper, science, university and departmental libraries. In addition, there are special committees to consider such questions as : classification, conventions, distribution of duplicates, employment, membership, methods, publications, and the new "Technical Book Review Index" under the able editorship of Miss Granville Meixell, librarian of applied sciences at Columbia University (see p. 141).

The official publication "Special Libraries" contains each month authoritative discussions of common problems, and keeps members in touch with association activities and developments. Another recent publication of the Association is the third, silver jubilee edition (1935) of the "Special Libraries Directory of the United States and Canada" which first appeared in 1910 as a modest list of 108 special libraries. This latest edition now includes 1475 entries, and is the result of laborious compilation. As will be understood, the Special Libraries Association was in the best possible position to advise me upon the tour of American scientific and technical libraries which I intended to make ; and my best thanks are due to the secretary, Miss E. L. Clarke, for her valuable recommendations and assistance.

ENGINEERING SOCIETIES LIBRARY, NEW YORK : This, the most important technical library in New York, was

formed between the years 1913 and 1916 from the combined resources of the four American national societies which work in close collaboration at 29 West 39th Street, and between them cover the whole field of technical science. Such a four-fold consolidation of libraries, which had overlapped each other in scope, eliminated the previous duplication of books and periodicals, economised in routine administration and upkeep, co-ordinated the work of the information service, and simplified matters for the readers, since there was henceforth but one library to be visited, and one card-index to be consulted, instead of four. The founders had visions of a national library for technical science, and opened it free to the public from the start. The library has since doubled in size, and contains at present about 145,000 volumes (which comprise 75,000 separate titles) selected with special attention to the needs of technical men. With up-to-date textbooks and current periodicals (of which 15,000 are received), the collections are kept abreast of recent research and technical advance, while rare old books and manuscripts provide the historic perspective of industrial development from ancient times.

For the classification of this mass of technical literature, the Brussels decimal scheme¹³ is used with excellent results. The indexes are compiled on cards of the international standard size (5 × 3 in.), and on one of them in each drawer there is a full printed explanation of how to use the index. On the alphabetical author index cards appear the Dewey decimal⁵ numbers, in accordance with which the books are shelved ; in the subject-matter index, we find both Brussels and Dewey decimal numbers on the same card, the former for classification, and the latter as shelf-mark. In this duplication we see how

small are the discrepancies which alienate the decimal classifications of America and of Europe, and how lamentable it is that these should not have remained *one* decimal classification for librarians over the entire world. There is also an alphabetical catch-word index to the *Classification Décimale Universelle*, similar to that in the Science Museum Library, but with American (instead of British) technical terms.

The books are shelved in order of subjects with the help of the Dewey decimal scheme, but the public are not allowed open access to the stacks; these are of modern steel construction with adjustable shelves, and the intermediate floors are carried on the continuous vertical columns. The lamp-shades are of thin sheet metal, and perforated in such a manner as to produce an even illumination. The main hall on the thirteenth floor has ample accommodation for readers, about 25,000 of whom visit the library in the course of a year; but this would no doubt be an under-estimate, for as Dr. Harrison W. Craver, the director, pointed out to me, he was more anxious to serve readers than to count them. The current issues of some 1000 technical periodicals are laid out on shelves for open access. In order that the material should be kept available for reference in the library, books are not as a rule loaned out to the public; but America is so vast, that inter-library loans have been instituted for the benefit of distant students and research workers, who thus have access to books which are not in their local libraries, and which are too valuable to be exposed to the hazards of loans to individuals. An automatic photostat machine is kept hard at work on double shift, and produces daily some 300 photoprints of articles needed for research.

The most important feature of this library is the excel-

lent information service, with its staff of technical experts to assist readers, and to deal with postal enquiries (more than 3500 of which are received each year); some of these are simple questions which can be answered at once, while others require weeks of careful research. As a rule, references to reliable published data are quoted in support of all information supplied; copies are then filed for future reference in accordance with the decimal classification, and the extent of the research is also noted on each. There is also an efficient translation service on the premises, in which is kept a comprehensive index of technical translations, whether prepared in the library or available from outside sources; this contains at present about 1600 entries. Drastic measures are taken for the disposal of duplicates, which are tied up in bundles and sent to a paper mill. The staff consists of 25 librarians and assistants, most of whom are (contrary to usual American ideas) trained in technical science as the first essential, rather than librarianship.

ENGINEERING INDEX SERVICE, NEW YORK: In close collaboration with the library described above, we find what is perhaps the finest example in existence of a "live" technical documentation service. This constitutes a cumulative card-index, with complete reference data and abstracts, of the current technical literature of the world. It is not restricted in scope, but endeavours to cover the whole field of technical science and related subjects. The survey of literature includes more than 1200 periodicals,⁶³ the transactions of some 500 technical societies, several hundred miscellaneous reports, and about

⁶³ See published alphabetical list: "Technical publications received by the Engineering Societies Library and reviewed by Engineering Index, Inc." 20 pp. Engineering Index, Inc., 29 West 39th Street, New York, 1933.

500 new books. No trade publications are reviewed. American and British publications account for about 65 per cent of the total, German about 15 per cent, and French about 7 per cent. There is a staff of expert translators, who deal with all but Chinese and Japanese (for which translated summaries are as a rule available).

In spite of this extensive survey, however, it is doubtful whether more than about one-third of the relevant articles are indexed; this is due to the manner in which literature on a specific subject is distributed in the journals which deal with it. As the result of statistical researches⁶⁴ carried out in the Science Museum Library, it has been found that the bulk of the articles on a specific subject are not published in a few journals specially devoted to that subject, or to the major subject of which it forms a part; but the articles are scattered in all periodicals, with a frequency approximately related inversely to the relation of their scope to the subject in question. It follows that the only way to index *all* the articles on a specific subject would be to scrutinise continually several thousands of journals, the bulk of which would yield only occasional references or none at all. Because this is quite impracticable, a considerable proportion of the total number of references must be inevitably missed. For the same reason, specialised libraries cannot hope to acquire the complete literature of their subjects. In practice, about one-third of the contents of specialised libraries is usually related definitely to their scope; the remainder consists of literature on border-line and less related subjects.

However, this technical index service, as mentioned above, is the most comprehensive in existence. It is

⁶⁴ Bradford (Dr. S. C.), "Sources of information on specific subjects." Publication No. 1, British Society for International Bibliography, London. Reprinted from "Engineering," 26 January, 1934, p. 85.

issued on standard library cards, 125 × 75 mm. in size. The data on each card consists of four parts : (i) classification, (ii) collation, (iii) annotation, and (iv) cartification. For the first, an elaborate system of catch-words ⁶⁵ has been built up and braced, like a firm structure, with abundant cross-references ; this has already been described in a recent article ²⁵ of mine. The second contains the title of the article in the vernacular, the name of the author and of the periodical from which the reference is taken, the volume and part number, with the date as a double-check. As the annotation (iii) consists of about five lines, into which must be condensed a brief account of the article, we find such terse phrases used as none but our American friends can produce ; the actual abbreviations are limited to those approved under the American Standards Association. The cartification (iv) consists of reference numbers to enable the cards to be easily sorted for distribution to subscribers. In the bottom left hand corner is a classification number to correspond with the particular subject-matter division (into 285 of which the whole service is divided) ; opposite this we find the serial number of the card, which incorporates also its date of issue. For internal use, in addition to the published catch-word and author indexes, the references are also filed under the respective periodicals. Sufficient cards are printed for distribution to subscribers, and no more ; as in the unfortunate case of so many American publications, no back issues are held in reserve, and the service is therefore not retroactive.

As soon as received and recorded in the library, the relevant periodicals are passed up to the editorial staff, which consists of technical experts and translators.

⁶⁵ Hannum (Joshua E.), " Subject headings for technical literature." *Special Libraries* (New York), vol. 22, no. 8 (October, 1931), p. 354.

An abstract or annotation (about 35 words) of each article is spoken into a dictaphone, and a slip to correspond is inserted in the periodical; this quick method saves the valuable time of the technical specialist, and enables the promptness of the Service to be maintained. Both the periodical and the dictaphone cylinder are then passed to an experienced secretary, who extracts the reference data from the former, and adds the annotation recorded on the latter; her written slip constitutes the manuscript for the index-card. After this has been checked, four such references, of which the same number of cards will be needed for distribution, are cut on the same wax stencil; small Gothic print is used, fourteen letters to an inch. These stencils are printed on 12-inch card strips, accurately 125 mm. wide; the ink dries in half an hour. The strips are then cut with rotary shears into four cards, each accurately 75 mm. deep, and four holes are punched in the standard position for the cabinet rods; the small difference between 12 inches and 300 mm. is an allowance made in order to obtain accuracy in the finished card.

The editor, Mr. Hannum, likes to think of his index service as three products: (i) a daily newspaper on cards, of which 200 are printed and despatched to universities, public libraries, research laboratories and works, in the afternoon of the same day on which the publications annotated therein are received; in short, a fine example of American hustle, (ii) a whole series of 285 weekly technical reviews (also on cards), each specialised in one of the subject-matter divisions mentioned above, and (iii) the annual bound volume, a comprehensive dictionary of the technical sciences; in this the cards of the previous year are reprinted in subject order under an elaborate system of catch-words, and provided in addition with

an author index (about 25,000 entries) and a complete alphabetical list of all the publications reviewed. This volume takes about three months to edit; but it then replaces the cumulative card-index service, and in most cases is found more convenient for reference purposes.

NEW YORK PUBLIC LIBRARY, NEW YORK: The corporate existence of this library commenced in 1895, with the consolidation of the Astor Library of 266,000 volumes, the Lenox Library of 86,000 volumes, and the Tilden Trust of 2,000,000 dollars (which, for our American friends, would appear to constitute an important factor in life). The present structure, opened to the public in 1911, is situated on Fifth Avenue at Forty-second Street, in the very heart of New York. In addition to this central library, which contains the administrative offices, there are no less than 56 branches. It is not intended as a show place; there are no elaborate interior decorations to attract visitors, who would see plain marble corridors but no books. The rooms are planned and administered, not for the casual reader, but for the student who wishes to work undisturbed, and to whom quiet is essential. Because the corridors are spacious, the library is able to receive 11,000 readers daily without confusion. The reference department contains more than 2,250,000 books and pamphlets, and the circulation department about 1,370,000 volumes, which makes a total of 3,620,000 in all. The recorded number of persons who use the reference department is about 2,250,000 per annum, who consult some five million volumes in the course of a year. The actual use is much in excess of this, because thousands of books are consulted without written requisition forms. The library

receives more than 30,000 current serials and periodicals, about 7500 of which are available in the periodical room on the first floor. The circulation department lends out some 13,500,000 books a year for home use. The staff consists of about 1500 librarians and assistants; of these, 700 are in the reference department, and 800 in the circulation department.

The main index is accommodated in a spacious hall on the third floor; in cabinets around all four walls are some 6000 drawers of cards. The index is in "dictionary" form, with author, title and subject entries in the same alphabetical series; it duplicates entries in the fourteen special collections. Adjacent on the west side is the main hall of the library with seats for 770 readers, to whom it is open from 9 a.m. to 10 p.m. on weekdays without exception, and from 1 to 10 p.m. on Sundays. Around the walls are shelved some 20,000 volumes for open access. There are seven floors of book-stacks, where the volumes are shelved in subject order. These are served with continuous electric book-lifts (paternosters); stout canvas-covered boxes are used for protection. The photostat workroom has five machines.

The science department contains a valuable collection of 250,000 volumes on pure and technical science, and receives about 500 current scientific periodicals. It possesses the British and United States patents complete, and receives in addition the French, German, Danish and Swedish. The department comprises four rooms devoted to pure science, chemistry, technical science, and patents. Each has a separate shelf-list; in addition, there is a departmental "dictionary" card-index, to which some 35,000 cards are added each year. The cabinets and fronts of the drawers are painted with horizontal and vertical stripes of various colours, so

that a drawer misplaced would break either its vertical or horizontal line, and thus be readily noticeable. There is a staff of 22 in the department. The chief, Mr. W. B. Gamble, has in preparation a periodical book-list on the history of aeronautics. The hours for readers are the same as those mentioned above for the library as a whole.

APPLIED SCIENCE LIBRARIES, COLUMBIA UNIVERSITY, NEW YORK: The collections of Columbia University contain at present about 155,000 volumes of scientific literature in the various departmental libraries, and of these more than 20,000 technical works are in the Applied Science Libraries. These are shelved in accordance with the Dewey decimal classification,⁵ and Cutter numbers are used for the order within each main class. Most of the technical theses of universities are stored in box-files, but those of special importance are indexed as books. Third-year students are allowed access to the shelves. The dictionary card-index contains author and subject entries (with location data) for all scientific and technical works shelved in other departmental libraries of the university. About 320 technical periodicals are received, a number of which are on open access for the students. In the list of current periodicals, one finds such entries as "Archiv für wärmewirtschaft und dampfkesselwesen" which show that our American friends have not the same respect for substantives as have the Germans (who write them with capital letters); however, it seems to me that when one writes in German, one should write as the Germans do. All periodicals are scanned on receipt, and members of the university staff are kept informed of new articles in their special fields. Index entries for articles are not duplicated in

the central library, but are filed only in the respective departmental libraries.

Particular importance is attached to trade publications ; these are not to be belittled as mere sales literature, but constitute a valuable source of information in the hands of a competent librarian. Such an un-indexed mass of material, however, appears to most librarians like an uncharted ocean ; but Miss Granville Meixell has here solved all the problems connected with its efficient utilisation. The trade publications are divided into two separate collections : (i) a bulk collection with 25 to 50 copies of each pamphlet intended for class use, in which only the latest editions are shelved in subject order, and (ii) a reference collection with but one specimen of each, in which all earlier editions are conserved and shelved in alphabetical order of manufacturers. The bulk collection (i) is made up into sets for three or four class periods in accordance with the university course specifications ; these sets are requisitioned for, and issued to students, as individual books. When the manufacturer issues a new publication to supersede the one in use, the latter is discarded. The material is stacked with stiff cardboard markers between the sets, which are lettered and numbered for shelf location. The reference collection (ii) is shelved under the names of the manufacturers ; this is a convenient method, as some of the companies handle such a varied trade that it would be impossible to place their pamphlets in one particular class. Each manufacturer has a three-place Cutter number to represent his name. The collection is not shelved in pamphlet boxes (which would keep the material clean but are otherwise inconvenient for a much-used collection), but in Princeton files ; these metal holders keep the pamphlets vertical and visible, and each takes a renew-

able label. This collection is indexed the same as books would be ; no old editions are ever discarded, and all except absolute duplicates are kept for reference purposes. In addition to the pamphlets, about 160 current trade periodicals are received ; but, with a few exceptions, these are all American.

The new South Hall, which Mr. John Buchan opened last year in the presence of some 300 librarians from universities all over the United States, has been built to meet the requirements of Columbia University for the next 50 years, and is of particular interest as the *dernier cri* in American library construction. The excavations were started in 1931, and the steelwork in 1932. The exterior is finished in the Italian Renaissance period, in order to harmonise with the adjacent university architecture. There are seven stories which enclose fifteen tiers of book-stacks ; each tier forms a separate unit with a floor of reinforced concrete and sound-proof tiles. In the centre are four electric elevator-shafts to enable students to obtain books on all floors. This new library is unique in that the book-stores are air-conditioned ; dust and sun are excluded, while humidity and temperature are carefully controlled. These internal stacks are separated from the remainder of the structure with fireproof walls, and are provided with a separate roof ; so that fire in another part of the structure would not penetrate the book-stores. There is shelf space for 3,000,000 volumes, while future provision can be made for an additional million books.

The main hall can seat 360 readers ; there are also sixteen smaller rooms, departmental and seminar studies, an academic theatre to seat 300 persons, and adequate accommodation for the administration and staff, and for the library school (to be described in the next section).

Pneumatic tubes connect all important rooms and the main loan-desk with all floors of the book-stacks. Requisitions are sent to all parts of the stacks in these tubes, and the books are delivered on small electric elevators and continuous book conveyors; the entire operation is mechanised. An electric indicator informs borrowers of the arrival of their books, and flashes the numbers on a screen on the wall. The main card-index contains in all about 5,000,000 cards, which means rather more than three for each book (one under the author, one under the subject, and a third under the title). The total collections of Columbia University amount at present to about 1,450,000 volumes. To move about 1,200,000 books into the new South Hall took more than a month of hard work. There was no lack of help, and about 60 students assisted the professional movers, under the able direction of the librarian, Mr. R. Howson. The old library will continue to be used for the rare book department, and as a museum and ceremonial hall.

SCHOOL OF LIBRARY SERVICE, COLUMBIA UNIVERSITY, NEW YORK: This department of the university has at least two claims to distinction. Established in 1887, it was the first school in the world for professional librarians, and had for its founder no less a man than Dr. Melvil Dewey, the father and devoted pioneer of decimal classification.⁵ Two years later, when he became director of the State Library, the school followed him to Albany, where it remained until 1926. In order to have the benefit of university association, it was then re-established at Columbia. On at least two occasions after 1926, Dr. Dewey visited the school and spoke to the students. Since his death in December, 1931, annual

ceremonies have been held in his memory. The library school of the New York Public Library was also transferred to Columbia in 1926, and consolidated with the new School of Library Service. This is now housed in the beautiful new South Hall (described in the previous section), where it occupies the fifth, and most of the sixth floor.

In addition to the administrative offices and seminar rooms, there are six lecture halls, five workrooms, and another used for social purposes on the fifth floor. The special library of the School, located on the sixth floor, provides ample accommodation for readers, and a reference "laboratory" in which is shelved a standard collection of reference works for the exclusive use of students. The whole library in South Hall serves, however, as a laboratory for students of the School. It aims to furnish technical and professional instruction in documentation, the production, distribution and use of books, and the administration of libraries. To this end some 110 special courses have been developed, from children's literature to advanced classification. There are about 250 students in the School, and in a recent summer session more than four hundred were admitted. Students whose course schedules permit, are allowed to avail themselves of opportunities to work in local branch libraries, in order to supplement their studies with first-hand practical experience.

BRITISH LIBRARY OF INFORMATION, NEW YORK: Well located on Madison avenue about five minutes' walk from the New York Public Library (described on p. 139), is an official information bureau which the British Government established in 1920, to meet the increased American demand for publications of H.M.

Stationery Office, and for reliable information on British affairs. This is a special library in two senses, because (i) it contains only information relevant to the British Empire, and (ii) this information is official in character. The publications which form the main part of its collections are those issued under the imprimatur of H.M. Government within the British Empire ; there are publications from Great Britain and Northern Ireland, the Indian Empire, our colonies, protectorates and mandated territories. These constitute information of an authentic character prepared in response to the actual necessities of administration. The library also acts in the United States for the sale of S.O. publications, three copies of which are stocked in neat box-files. These are shelved in the same order as the S.O. code numbers ; no particular scheme has been adopted for their subject-matter classification, but a catch-word index of popular title cross-references has been found useful. There is also a complete set of the official S.O. lists, from 1913 to date, to serve as index.

The unofficial publications are shelved in a separate collection, and have a dictionary card-index (with author, subject and title entries) on standard 5 × 3 in. cards. In addition to a comprehensive collection of standard British reference works, a number of periodicals are received, such as "The Times" and "The Listener" which contain commentaries on British affairs. The public documents and books on India comprise what is perhaps one of the finest special collections in the United States. A file of extracts from American newspapers is maintained, for information on the American point of view in relation to British affairs. In addition to statistical and other reference material, the collections cover a wide field : political, social and economic questions, as well

as historical, scientific and technical works, literature and the arts.

The library is open to the public for reference from 10 a.m. to 4 p.m. on weekdays ; the documents are not circulated to private individuals, but are available on inter-library loan. About 9000 telephone enquiries and 16,000 letters are answered in the course of a year ; the authorities for all information are cited on request. So far as possible, official facts are supplied, and press reports are not relied upon ; information is not " flavoured " for American consumption. This service is free to the public. The official S.O. lists are distributed to some 5000 clients ; but apart from this, no unsolicited information is sent out. The senior staff are British, but the clerical assistants and operative personnel are local. In the field of economics and scientific research, British experience is of particular value in the United States ; and since our official publications ⁶⁶ set forth the authentic records in such admirable fashion, this library is able to fulfil a useful function in New York, and (what is even more important) its excellent information service helps our American cousins to understand what the British Empire stands for, in the vast economic structure of the world.

✓ **LIBRARY of the MUSEUM of SCIENCE AND INDUSTRY, NEW YORK :** This museum is like a small edition of the Science Museum in London, enthusiastic and efficient. The collections are not rich in authentic historical relics (neither are the United States, for that matter), but their presentation of models to show the elements of science and its industrial applications, with concise

⁶⁶ Wilberforce (Robert), " John Bull : publisher." 3 pp. with illus. British Library of Information, 270 Madison avenue, New York, 1931.

descriptive labels for the public, is admirable. Since 1930, the museum has been located on Forty-second Street, near Grand Central Station, with ample space to develop its collections.

To supplement the work of the museum, the library is devoted to pure and applied science, with particular reference to inventions and their part in the foundation of civilisation; a bust of Edison occupies the position of honour. The books are shelved in accordance with the Dewey decimal scheme,⁵ and Cutter numbers are used to locate the works within each subject-matter division. In the case of books which are above the standard size, wooden "dummies" are substituted, with the title and location reference to the oversize shelves. This would appear to be a practical scheme, where the public have open access, but rather wasteful of shelf-space (the dummies were about an inch thick). The stacks were of modern pressed steel construction with adjustable supports. Catch-word labels were attached to most of the shelves, as an aid to the public. The unbound current numbers of about 50 technical periodicals were available on open access. The main dictionary index (of author, subject and title entries) was maintained on standard 5 x 3 in. cards; where possible, the L.C. printed cards⁵⁹ were used. For subject-matter classification, a catch-word scheme based on that of the H. W. Wilson Co. was used. There was an extensive collection of trade pamphlets filed in steel cabinets; separate files of newspaper extracts and mounted illustrations were also kept in simple but practical order of alphabetical catch-words. No external loans service was maintained, except to officers of the museum; the library was, however, open to the public for reference purposes, with a comfortable room provided for their use.

LIBRARY of the BELL TELEPHONE LABORATORIES, NEW YORK: This specialised technical library was started in 1914 with a nucleus of a few hundred volumes on telephony. It contains at present about 35,000 volumes (which include bound sets of periodicals) and 8000 pamphlets on all technical subjects related to telephony and electrical communications. The library is maintained for the technical staff of the Laboratories, to whom its use is restricted. The main card-index of books and pamphlets is compiled in the usual "dictionary" form, with author and subject entries in the same alphabetical series; for classification, a modified form of the Dewey decimal scheme⁵ is used. In order to keep members of the technical staff *au fait* with new books and pamphlets, a monthly bulletin is circulated; this contains references to new accessions, and a list of recent translations is appended.

The library receives about 350 current technical periodicals, all of which are indexed. This is done in subject order on standard 5 × 3 in. index cards, which are then selected and edited for a semi-monthly bulletin. This is divided into broad subjects such as mathematics, chemistry and communications, which are in turn subdivided into smaller sections. For example, under chemistry there are entries for analytical chemistry, biochemistry, electrochemistry, surface chemistry; and under communications there are entries for telephony, radio, television, and so forth. The cards are also filed in a cumulative index, so that at any time a complete up-to-date reference list on a particular subject can be compiled. Articles of importance from current periodicals are referred to members of the laboratory staff who are known to be interested in certain subjects. The library is often asked to follow all the literature on a particular

subject, and in such cases a duplicate 5×3 in. card is made when the relevant articles are indexed, and sent to the person interested. He can then decide from the title whether he wishes to see the actual article, or otherwise file the card for future reference. The staff of the library consists of 19 librarians and assistants, who aim to furnish published material on any technical subject as needed for the work of the Laboratories; other services consist of translation work, internal loans of books, pamphlets and periodicals, and the maintenance of a newspaper extract file.

PRATT INSTITUTE FREE LIBRARY, BROOKLYN: Founded in 1887, this library contains at present about 145,000 volumes with special collections on technical science, the fine and applied arts, and book production; some 460 current periodicals are received. It comprises both reference and circulation departments; the former is open to readers from 9 a.m. to 9 p.m. on weekdays, and the latter lends out some 230,000 books in the course of a year. A school of library science is maintained under the same administration.

The special reference room for technical science was opened to the public in 1904 as the Applied Science Room; its purpose is to serve the educational scheme of the Pratt Institute, and to provide facilities for research workers. The local industries of Brooklyn are considered in the matter of book selection. The room itself contains some 3000 books; about the same number of bound periodicals are also shelved, either in the room, or in a basement store just underneath. There is a complete set of United States patents. These books and periodicals are circulated to members of the Pratt Institute, or to certain other persons at the discretion

of the librarian. The room receives about 150 technical periodicals; the current numbers are placed on tables (for open access) with a table devoted to each branch of industrial science as far as possible. The bound volumes are shelved in the basement, except those periodicals which are indexed in the Industrial Arts Index. The last ten years of these periodicals are shelved in the room for convenience. The files of Science Abstracts and Chemical Abstracts are complete.

The card-index contains author and subject entries for all books in scientific and technical fields shelved in other departments of the library as well. The technical department of the Pratt Institute offers courses in chemical, mechanical and electrical science; the collections of this room are selected primarily with the needs of these courses in mind. No attempt is made to form a collection in the natural sciences. The periodicals received are examined for reviews of trade publications or similar material, and manufacturers are asked for copies. These are shelved in alphabetical order; author and subject entries are made, and the cards are filed as a supplement to the main card-index. Periodicals are also examined for reviews of new technical books, and an author index of such reviews has been kept from 1907 to date; only British and American books are listed. The most important documentation service is the publication "Technical Books" which the librarian, Mr. William W. Shirley, compiles each year. This contains a list of about 100 new technical books, and was first issued in 1908; it contains brief annotations of all works mentioned therein, and is distributed to other libraries and to readers who need help in the selection of books to purchase or read.

YALE UNIVERSITY LIBRARY, NEW HAVEN, CONNECTICUT: In the evolution of modern libraries, it has become almost a matter of course to treat the book-stack as an undesirable feature to be subordinated in the exterior architecture; thus the heart of the structure is often obscured in the rear façade, behind a screen of monumental rooms. The new book-stack at Yale has, however, been placed in the most accessible and important position on the whole site. A superb piece of modern Gothic, this book-tower rises 150 feet, and dominates the campus from all directions; built upon a steel framework, the flatness of its buttresses, however, asserts the New World, and belies a would-be mediæval character. The total collections of Yale University number at present about 2,480,000 volumes, of which 1,920,000 are shelved in the central library, and 560,000 in the various departmental libraries. The accessions amount to about 105,000 volumes per annum, and some 13,750 current periodicals (newspapers included) are received. The collections in special departments devoted to pure and technical science number about 235,000 volumes and 60,000 pamphlets.

The entrance hall takes the form of a memorial chapel; as the visitor enters its portals, the main delivery-desk confronts him at the far end. This is of carved oak, and contains the most complete equipment for communication with the book-stack and all other rooms. A continuous lift delivers books in a few minutes; telephones and pneumatic tubes for call-slips connect to all floors. On the left is the public card-index, to which some 300,000 cards are added per annum. Not more than about 30 per cent can be supplied with the printed L.C. cards.⁵⁹ All volumes are indexed here for the various departmental libraries, and a union-list is maintained;

the code of the American Library Association is used. The main hall is well lit with beautiful traceried windows ; its slender proportion and the warm colour of the plastered walls render it pleasant for readers. Decorative oak bookcases form a wainscot on two sides, and contain about 9300 volumes for open access. The floor, which for the sake of quiet had to be of some other material than stone, is made of a special rubber composition.

On the other side of the entrance hall, a vestibule leads into the periodical room, whose open shelves hold the current numbers of about 1800 publications ; some 28,000 readers avail themselves of its facilities in the course of a year. In the newspaper room, about 2500 readers make use of 7000 volumes per annum. The rare book room is decorated in the Jacobean period ; this balconied hall, with its recessed alcoves, is a favourite with visitors. Behind the rare book room, and sheltered from the noise of the street, the librarians' offices face upon an enclosed court. On the other side of this court is a pleasant hall in the Tudor period, intended as a club-room for the students. On the court side are six comfortable alcoves ; traceried windows and panelled book-cases produce a cheerful atmosphere. The room contains about 25,000 books ; some 26,500 volumes are lent to 3600 readers per annum. On the opposite side of the main entrance is the reserve book room, with about 13,700 volumes on its open shelves. Behind this room is the memorabilia room, which contains an historic collection of Yale publications. In the corridor outside, a small stair leads to a secluded corner where part of the Yale library of 1742 has been reconstructed. Panelled in white pine and lit with narrow casements, this little room impresses one with the remarkable evolution of the library in the course of two hundred years.

The massive steel book-stack tower is a spectacular creation in the tempo of these modern times. Centralisation of the books was the first consideration to be studied. There are sixteen tiers, separated with thin marble deck floors, one and a quarter inches thick, supported on the framework of the book-stack ; all the steel connections are welded solid. Open-bar shelves are used, which present a minimum surface for the collection of dust, and assist in the ventilation and preservation of the books. To allow for expansion of the various collections, provision has been made for some of the minor aisles (parallel with the five-foot main aisle) to be converted for use as book-stores. There are six and a half miles of such aisles in the book-stack tower. For research students, some 330 cubicles have been provided in the stacks ; each measures about 5 feet square, and has three book-shelves and a desk with lockable drawer. Here students can collect their books and manuscripts, and work in peace, with volumes required for reference near at hand in the main stacks.

At the centre of each stack floor is concentrated all the service equipment : elevators, book-lifts, telephones, pneumatic tubes for call-slips, stairs, and the attendants' desks. The continuous book-lift runs on an endless chain at a speed of 75 feet per minute. Books placed in the carriers at the various stack floors are combed into a receptacle at the delivery-desk. There is an automatic device to stop the lift in the event of an accidental overload. The illumination of the stacks has also received special attention, with perforated reflectors to produce an even distribution. The size and position of the perforations controls and softens the illumination on near books, while a white vitreous enamel surface reflects to more distant parts of the shelves. The staff

(for the administration of the central and 45 departmental libraries) consists of 115 librarians, exclusive of part-time assistants and the operative personnel.

LIBRARY of the MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASSACHUSETTS: The foundation of this Institute dates back to 1861, when an act was passed in the General Court of Massachusetts to incorporate it for "the advancement, development and practical application of science in connection with arts, manufactures and commerce." Due to the civil war, however, the courses of instruction did not commence until October 1865, when fifteen students were enrolled. At the end of the last year, the Institute had an enrollment of 2385 students, and there were 512 on the educational staff. Because of the advanced work and research carried out at the Institute, its academic affiliations are with universities rather than with other technical schools. The library has resulted from the consolidation of a number of departmental libraries; and its collections number at present about 305,000 volumes on technical science, of which some 50,000 are distributed in the various branch libraries. The accessions amount to about 8250 volumes per annum, and more than 1300 current technical periodicals are received.

The main hall of the library is on the fifth floor, under an enormous dome of 72 feet diameter, and has seats for 170 readers; the offices, work-rooms and a three-tier book-stack are disposed around the rotunda. The centre of the inner dome is 70 feet above floor level, and a Foucault pendulum has been suspended there (which has, of course, no relation to librarianship). The interior of this rotunda was patterned on the Panthéon at Rome. Wall cases contain the principal and

most-used reference works, such as periodical indexes and abstracts; the current issues of most periodicals not allocated to the branch libraries are also shelved here, and a table is reserved for the most recent accessions. Behind the circulation desk, is a collection of standard text-books used in all courses at the Institute. Members of the educational staff, and senior students, are admitted to the stacks; other readers obtain their books in response to their written call-slips handed in at the circulation desk, after consultation of the public card-index. This is of the usual dictionary form, and constitutes a union-list of all material, whether shelved in the central library or in the branches. The card drawers are double-ended, for the use of readers on one side, and the staff on the other, as in the *Université Libre* at Brussels (see p. 71). So far as possible, the printed L.C. cards⁵⁹ are used, and the branch libraries are also supplied with them.

The collections are classified in accordance with the Dewey decimal scheme,⁵ except those on naval architecture, which have a classification of their own; certain other fields also have special modifications, in defiance of the principles of inter-library co-operation. An important aid to users of bound periodicals in the stack, is the visible index to periodical files. From this, a reader can ascertain at once the extent and location of every periodical file, whether current or dead, and whether shelved in the central library or in one of the branches; more than 3000 titles are covered. A shorter index of the same kind, for current periodicals, stands at the circulation desk. Such indexes are expensive, but have proved their value in use.

On their receipt, periodicals are recorded upon 8×5 in. cards in a visible file cabinet, in which the cards lie

flat in horizontal drawers. Each drawer holds about 75 titles ; the cards are of medium manila, in aluminium holders. The central library is open from 8.45 a.m. to 9 p.m. on weekdays in term-time, and the public are free to make use of its resources. External loans are, however, restricted to students and members of the educational staff ; from other borrowers, a fee of 10 dollars per annum is required. About 77,000 volumes are circulated in the course of a year. Numerous loans are also made under the inter-library loan scheme, which includes all "special libraries" and even the research departments of industrial concerns. The reference department prepares brief book-lists on technical science, or more comprehensive ones in response to specific enquiries. Photostatic copies of articles for readers are obtained from the Institute's own photostat service. The library does not maintain a bindery of its own, but has one book-repairer who also letters the books.

It is intended that the branch libraries should remain "live" collections, and hence there is a frequent transfer to the central library of books not in active use. Each branch is under a full-time librarian, who in some cases has part-time assistance. The books for all branches are ordered, received and indexed in the main library, in which the administration is centralised. Inter-departmental telephone lines help to accelerate the service. The central administrative staff consists of the librarian, Mr. William N. Seaver, and 16 assistants ; in addition, each of the nine branches has its departmental librarian, most of whom do their own specialised documentation and reference work. There are also about 27 student-assistants, equivalent to four full-time assistants. Applicants for positions are expected to have been trained

in librarianship, and must be conversant with at least German and French.

LIBRARY OF HARVARD UNIVERSITY, CAMBRIDGE, MASSACHUSETTS: Two years after the foundation of the university, the Reverend Mr John Harvard, sometimes Minister of Gods Word at Charlestown, in his last Will and Testament of 1638, bequeathed th' one Moiety or halfe parte of his Estate, and all his books. He had come to the New World little more than a year before, with his library of four hundred volumes. The first library was built in 1643, and John Harvard's books were placed in it. This small nucleus increased steadily with liberal donations, until the collection (with more than 5000 volumes) had become the most important in America. Some of the benefactors also aided the librarian with advice and criticism; in 1725, for example, Thomas Hollis of London wrote: "You want seats to sett and read, and chains to your valluable books like our Bodleian library . . . you know their methods wch are approved, but do not imitate them, you let your books be taken at pleasure home to Mens houses, and many are lost, your Students take them to their chambers, and teare out pictures and maps to adorne their Walls; if you want roome for modern books, it is easy to remove the less usefull into a more remote place."

But the library thus slowly accumulated for 125 years was not destined to last; from the fire which consumed the first Harvard Hall and its collections, only one of John Harvard's books was saved. The second library was built in 1766, and the inflow of printed matter was so rapid, that to maintain a list of the collection presented serious difficulties. About 1780, experience had shown the alphabetical lists to be inadequate, and a

manuscript subject-index was commenced as a natural development from the early alcove lists. Some ten years later, this had become so choked in certain sections, that blank sheets of paper had to be inserted to record new books. The book-shelves also became so overcrowded, that in 1838 the corner-stone for an adequate and fireproof structure was laid, to be known as Gore Hall. This was a pure specimen of fourteenth century Gothic, and the books were placed in alcoves; to avoid the risk of fire, no wood was used in the construction where it could be replaced with stone, brick or iron. In 1877 an addition had to be built to accommodate about 235,000 volumes; this is of special interest as the first example of a modern book-stack. It became, however, more and more crowded, and thousands of books had to be removed to cellars and basements.

In 1912 there were some 7000 volumes thus in exile, and plans for the new Widener Memorial Library were drawn up. The corner-stone was laid in 1913; inasmuch as part of it was to cover the site of Gore Hall, about two-thirds of the books had to be removed, and places found for them to be so stored as to remain available for use. In 1915 the work was completed, and the replacement of the books into their new (and present) home was carried out in the course of the summer. This is a massive square structure of limestone; three sides are occupied with the book-stacks. The other (north) side has broad steps, surmounted with a colonnade, which lead up to the main entrance. The vestibule and entrance hall are finished in marble. On the west side is the council room and rare book collection; a corridor to the left leads to the administrative offices. From the entrance hall, a broad staircase leads up to the Widener Memorial rooms which form the central feature; here

the main staircase divides, and leads on either side to the second floor. The main hall of the library with the adjacent periodical room has seats for about 300 readers ; at the end is the delivery-room in which is located the public card-index. This was formerly divided into two parts : (i) an index of authors, and (ii) an alphabetical catch-word index of subjects, with numerous subdivisions under each class, likewise in alphabetical order. The increased number of entries in the latter, however, made it more and more difficult to use and expensive to maintain, until in 1915 it was abandoned as a separate index. The cards of its various sub-divisions were intercalated in alphabetical order with the author entries (i), to make one index in place of two. This form of "dictionary" index is the one now used in most American libraries. The entries had, however, been made on cards of various sizes, and had to be re-written on standard 5 × 3 in. cards, in order to make use of the L.C. printed cards⁵⁹ wherever possible. This formidable task was commenced in 1911, and is now almost completed.

On the third floor, there are about 30 rooms for the special libraries, and studies for research students. The main book-stacks, which run around three sides of the structure, comprise ten floors with shelf-space for 2,200,000 volumes ; a special feature is the provision of about 300 cubicles for students, around the sides of the principal floors. In addition to these, more than 60 small rooms are provided for the use of professors and visitors. The main collection contains at present 1,650,000 volumes, exclusive of 250,000 in the special libraries. In addition, the seventeen departmental libraries (which are also under the direction of the librarian, Mr. Alfred C. Potter) contain 1,530,000

volumes, and the seven house-libraries 62,000 volumes. The total collections of Harvard University amount at present to about three and a half million volumes, with 1500 incunabula and 3000 manuscripts; the map collection numbers about 37,500 sheets. The demands of research workers for current material are well supplied, and it has been estimated that some 13,000 periodicals and serial publications are received. The departmental library for technical science contains about 22,300 volumes in mechanical, civil and electrical fields, as well as a considerable number of works on allied sciences, such as chemistry and mathematics. Files of some 150 current technical periodicals are maintained. There is also an important collection of reports and pamphlets to supplement the text-books and periodicals.

LIBRARY of the FRANKLIN INSTITUTE, PHILADELPHIA : Toward the end of 1823, a committee was appointed to report on the constitution of a technical institute in Philadelphia; so enthusiastic was the response, that early in the next year the historic Franklin Institute had been founded and chartered for "the Promotion of Manufactures and the Mechanic and Useful Arts." The first exhibition of American Manufactures was held the same autumn, since when the Institute has continued its educational work with lectures, instructional museum collections, and library facilities for scientific research. In the course of 110 years of such useful activities, numerous efforts were made to house the Institute in adequate premises; these were not, however, realised until 1933, when the present palatial structure was completed. This contains one of the most important technical museums in the United States, dedicated as a memorial to Benjamin Franklin; with lecture hall, a

planetarium of 65 feet diameter, laboratories, and a library for scientific research.

The main hall of the library is on the second floor, and has seats for about 150 readers. As a rule, its use is restricted to members of the Franklin Institute, but others in need of special books can have them made available on request. The collections amount at present to 130,000 volumes on technical science, with valuable old sets of periodicals. This is a research library, to aid in the production of new ideas, and for this purpose some 33 private studies are provided. There is also a special room for United States patents. The book-stacks are of quite modern construction on five stories, with adjustable steel shelves and electric book-lifts, and are planned to accommodate 30 years of accessions. Roller-shelves are provided for some of the heavier folio volumes.

The dictionary card-index for the use of readers contains author, title and subject entries. For classification, the Dewey decimal scheme⁵ is used, but its adoption has still to be made retrospective in some of the earlier parts of the collection. The books are shelved in accordance with the Dewey classification, and Cutter numbers are used to locate them within each class. Patent specifications, of which there is an extensive collection (both American and British), are bound with stout paper and shelved in box-files. About 1000 scientific periodicals are received, most of which are placed in vertical racks for open access; the current numbers are thus readily visible, and do not collect the dust. Standard reference works and recent accessions are also placed on open access. The external loans service is confined to textbooks, and to members of the Institute; photostatic copies of articles are made on the premises. The staff

consists of nine librarians and assistants, exclusive of the operative personnel.

LIBRARY of the ACADEMY OF NATURAL SCIENCES, PHILADELPHIA : Opposite the Franklin Institute, on a fine open square near the centre of the town, is situated one of the oldest American scientific academies, founded in 1812. Its educational activities consist in the maintenance of a free museum of natural history, and the provision of public lectures. The library contains one of the finest collections on natural history in the United States ; its use is not restricted to members, but the public also have free admittance from 9 a.m. to 5 p.m. The spacious main hall is one of those beautiful examples of early American architecture which one finds in Philadelphia ; there are seats for about 50 readers. The author index is kept in manuscript form on standard 5 x 3 in. cards ; the publications of corporate bodies are entered under their town-names. The shelf-number is written on each card. There is a separate index for independent periodicals, which are cross-referenced under their titles and town-names. There are, however, no title entries for text-books.

The subject-index (for books and periodicals) is systematic in 15 main classes, which are sub-divided into smaller sections under catch-words ; the shelf-numbers are also written on these cards. The stacks are on five floors with an electric book-lift, and contain at present about 100,000 volumes. The text-books are shelved in accordance with the systematic subject-index, and in accession order within each subdivision. Journals, on the other hand, are shelved under the town-names. In order to economise vertical space, oversize shelves are reserved for folio volumes. About 80 per cent. of

the accessions are received in return for scientific publications of the Academy, which are distributed to some 900 kindred institutions. The external loans service is restricted to members; inter-library loans are almost entirely in the outward direction. In order to keep abreast of current research, most of the new purchases consist of periodical publications rather than text-books.

LIPPINCOTT LIBRARY, UNIVERSITY OF PENNSYLVANIA, PHILADELPHIA: The campus of the State University of Pennsylvania is located in a pleasant quarter of Philadelphia, some distance out from the centre of the town, but within convenient reach, thanks to a frequent service of street cars. In addition to the main library, with comprehensive resources open to all, the departmental Lippincott Library is of special interest to students of applied economics and the social sciences. Founded in 1927 as part of the educational equipment of the Wharton School of Finance and Commerce, it constitutes a veritable laboratory attached to the class-rooms, and is therefore of particular value to research workers.

The collections contain at present about 45,000 volumes, and some 500 current periodicals are received, most of them devoted to applied economics, statistics, commerce, industrial science and transport. Intended for the use of professors and students, who have open access to the shelves, these valuable collections are also available for outside consultation. Factual information has been stressed, and there are numerous reference works, directories and indexes to sources of information. Corporation reports, Federal and State publications, and an excellent collection of trade and economic periodicals are assembled and correlated for special reference. The dictionary card-index for readers con-

tains author, title and subject entries ; the printed L.C. cards ⁵⁹ are used where available. There is also a classed index and shelf-list based on section 3 of the Dewey decimal classification,² supplemented with special lettered sub-divisions. For convenient consultation, the card drawers can be pulled out and rested on a small wooden shelf at elbow level ; to avoid misplacement, the drawers and cabinets are numbered to correspond. There are liberal cross-references under popular titles for works, and some books have even six cards for them in the index. Behind each card for a periodical are found one or more check cards, to show which numbers have been received. There is also a separate index for periodicals, to indicate their location.

The books are shelved under their respective subjects (with the aid of Cutter numbers) in separate alcoves, each of which is provided with a table for the use of readers. The receipt of serial publications is checked with coloured tabs on the accessions index ; the use of printed form letters reduces the amount of clerical work involved in the requests for lapsed parts. The information service maintains vertical files of pamphlets and ephemeral material useful to research students, which can be weeded out when superseded. Book-lists are compiled in answer to specific enquiries ; an annual list of "New books" is also issued, classified under catch-words and indexed under authors. The covers of new books are pasted up on notice-boards, and prove decorative as well as informative. In an annex is shelved a collection of bound newspapers, available to students without supervision. To serve the clientele of the Lippincott Library, is a staff of trained librarians and assistants familiar with its resources, who help readers to secure the information desired. An acquaintance with

other special libraries in Philadelphia enables Miss D. Bemis and her staff to direct readers to outside facilities, whenever the internal sources prove inadequate.

LIBRARY of the DREXEL INSTITUTE, PHILADELPHIA : Founded in 1891, the Drexel Institute is a technical university with four schools or faculties for about 1500 men and women students ; situated at the corner of 32nd and Chestnut Streets, it has convenient access to the principal railroad stations and elevated lines. The library was founded in 1892 to supplement the work of the various departments, and in the present collection of some 50,000 volumes, special consideration is shown for the educational scheme of the Institute, which covers pure and applied science and the useful arts ; duplicate copies of prescribed text-books are available for the use of students. The collection is also rich in *belles lettres*, and the Charles Dickens manuscript of " Our Mutual Friend " is one of its treasures. For book selection, the accession lists of the Pratt Institute Free Library (described on p. 151) are consulted ; about two-thirds of the books purchased are on technical science. The accessions amount to about 3000 volumes per annum. Much of the scientific data needed for research work is found in the current and bound volumes of periodicals, of which 395 are received.

The public dictionary card-index contains alphabetical author, title and subject entries, and is provided with adequate cross-references which are noted on the back of each main card. Wherever possible, printed L.C. cards⁵⁰ are used. The books for all departments are housed in the main library ; these are classified and shelved in accordance with the Dewey decimal scheme,⁵ and Cutter numbers are used to locate them within each

particular class. The shelf-list is in card form, and serves also as a classified index for internal use. The book-stacks are open to students of the Institute. Instruction in the use of the library and its indexes, for "freshmen" students, has become a matter of routine. In the course of a year, about 39,500 volumes are issued to 2200 borrowers. A collection of more than 3000 lantern slides (all classified and indexed) is available for the use of instructors. For routine administration, the library has enlisted the untrained labour of students, who have shelved books, pasted and labelled new accessions, marked call numbers, checked periodicals for the bindery, and done other useful work which has saved the time of the professional staff. That the students make rapid improvement in such routine, shows that it must be of educational benefit to them.

The librarian, Mrs. Anne W. Howland, is also dean of the School of Library Science, which was founded in 1892, and now occupies quarters on the second floor of the Institute. There is a special collection of books, pamphlets and periodicals for the use of students in connection with the prescribed courses in librarianship (ten of which are offered); the main library also affords an excellent laboratory for practical routine work. The number of important libraries in Philadelphia render it a desirable location for the School; the students are enabled to profit from these valuable collections, and to obtain practical experience under supervision. The curriculum is planned to cover methods found essential in all fields of librarianship; as first essentials, students are expected to have acquired a broad education in literature, history and science, and to be familiar with at least French and German. The educational staff consists of the dean, two professors and two instructors

in library science ; in addition, the class instruction is supplemented at frequent intervals with lectures from eminent librarians and specialists in their respective fields. There are at present about 35 students in the School, in addition to whom 30 were enrolled for the special summer course.

FREE LIBRARY, PHILADELPHIA : The foundation of this free municipal library is due to the vision of Dr. William Pepper, a prominent citizen of Philadelphia, who secured a charter in 1891. Three rooms in the Town Hall served as accommodation until 1895, when quarters were rented in Chestnut Street. The corner-stone of the present structure was laid in 1922, as part of a civic development scheme, and opened to the public in 1927. It stands opposite the Franklin Institute (described on p. 161). The columned façade of Indiana limestone rises one hundred feet above the base, which is 300 feet wide and 200 feet deep ; the structure contains six million cubic feet. Well-placed windows on all four sides and two interior courts provide natural illumination for all rooms, halls and corridors. With its all-metal equipment (from the three main entrance doors of massive bronze to the steel book-shelves), this is one of the most modern of libraries, and complete fire protection has been achieved ; wood has been used only in the music rooms for acoustical reasons.

The spacious entrance hall is used for special exhibitions of rare and valuable material. On the left is the office of the librarian, Mr. Franklin H. Price, and the main reference room with about 20,000 volumes and 100,000 pamphlets on open access. On the other side is the periodical room, with about 45,000 volumes (bound on the premises) ; some 3000 current periodicals (exclusive

of newspapers) are received. There are seats for 125 readers. The public card-index contains entries, cross-referenced under the titles of the periodicals and the corporate bodies who publish them, and under a series of subject catch-words. Bound volumes are shelved in an upper book-stack, while the more recent unbound numbers are available in a lower store ; both are served with an automatic book-lift. All periodicals must be requisitioned, and none is allowed out on loan. The two main corridors on the first floor are lined on both sides with card cabinets which contain a complete set of the L.C. printed cards.⁵⁹ There is a special reference room for public documents, of which the collections amount at present to about half a million. These are shelved under the respective departments with the help of Cutter numbers, and their receipt is recorded on the standard 5 × 3 in. cards. The public are not allowed access to these shelves. In the administrative offices, a union card-index is maintained for the main library and its 32 branches ; the central accessions department distributes all books to the branch libraries, with copies of the respective index cards.

The main book-stacks are in six tiers ; there are more than 43,000 shelves, the sections of which are spaced at 3 feet between centres. The intermediate deck floors are carried on frames of structural steel, to take both the dead-load and a live-load of 70 pounds per square foot of aisle. Telephones and pneumatic tubes are provided on all floors ; the stacks are also wired for electric vacuum cleaners. The internal transport of books is mechanised with horizontal belts, automatic lifts and a spiral return chute. The books are shelved in accordance with the Dewey decimal scheme,⁵ and Cutter numbers are used to locate them within each

class ; a shelf-list is maintained on narrow cards. The collections amount at present to about 810,000 volumes, with 120,000 pamphlets and 650,000 unbound documents. The newspaper department receives some 260 newspapers, with all of those (about 50) published in Philadelphia ; there is a complete set of the "Pennsylvania Chronicle" back to the year 1767. Special roller-shelves are used for the bound volumes. All newspapers, periodicals and books are bound on the premises. The bindery is equipped with machines which can sew about 1500 books per week ; sand-paper machines are used to finish the cut sides of the books, with air suction to remove the dust. There is a full staff of assistants for such incidental operations, in addition to the qualified book-binders, whose work (in stout canvas) is said to be three times as durable as the usual standard of American publishers.

The main hall of the library, on the second floor, has 30,000 volumes on open access, and seats for about 100 readers ; it also accommodates the book-counter of the circulation department. There are some 255,000 borrowers, and about five million books per annum are lent to them for home use ; the usual period of loan is two weeks. About 3,350,000 readers make use of the reference collections in the course of a year. This was one of the first American libraries to allow open access to the shelves. To supplement accommodation in the public rooms, there are 23 private studies available to *bona fide* research workers. Below the entrance hall is a lecture theatre with 400 seats, and a classroom for students of the Library School. The rare book collection contains some 130 manuscripts and incunabula ; the print room has special roller shelves and metal portfolio cases with exhibit frames above, and contains at present

about 145,000 prints. In the map department are filed some of historic value, as well as current maps of all kinds (about 19,000 in all). Most of them are filed flat in metal plan drawers, while the smaller are shelved in vertical files. There is also a special collection of embossed books for the blind, which are mailed free to readers in the eastern United States. The music department contains the most extensive collection of orchestral scores in America, and receives about 45 periodicals. There are a number of ear-phone machines which enable visitors to hear records in silence, and two sound-proof music rooms are also provided.

The children's department is most attractive, with book-cases, tables and chairs scaled to suit the small patrons; it has a separate entrance from the street. There is a collection of educational books for the use of teachers and parents, and a special file of pictures clipped from newspapers and illustrated periodicals; about 30,000 are pasted on cardboard mounts and filed in alphabetical subject order, while some 60,000 more are filed unmounted in envelopes. The walls are decorated with pictures of interest to children, and there is a bronze of Franklin as a child. Adults are not admitted, except when accompanied with children. In all, there are 505 persons on the staff roll, equivalent to about 400 full-time workers. These include about 235 qualified librarians and 75 assistants, with an operative personnel of 195 for the clerical and manual work; for their convenience, a cafeteria is provided on the roof. Another most attractive feature for the public (which could be developed elsewhere) is the readers' open-air terrace on the roof; this has become very popular with those who appreciate its tasteful decoration and atmosphere of informal ease, and the permission to smoke.

JOHNS HOPKINS UNIVERSITY LIBRARIES, BALTIMORE : Founded in 1876, the collections of the Johns Hopkins number at present about half a million volumes. Of these, some 360,000 are shelved in the main library, known as Gilman Hall, which was opened in 1916. The front façade, with its central tower, resembles the Independence Hall of Philadelphia, and no doubt owes much of its old-fashioned charm to this fact. The portico and vestibule lead into a memorial hall ; the two book-stacks are behind this, on either side of a central court, and surrounded with seminar rooms and administrative offices, with the spacious main hall for readers in the extreme rear (open from 9 a.m. to 9 p.m. in term-time). This has a pleasant semi-circular alcove, around which are placed the current numbers of periodicals on inclined shelves for open access. The upper floor is laid out on a similar plan, with the reference room above the memorial hall, treasure room above the vestibule, and classrooms above the main hall in the rear. Special features are the accommodation provided in the stack space for research students, and the convenient manner in which the smaller reference rooms are departmentalised. All research students have free access to the stacks, and are thus able to pursue their studies close to where the relevant literature is shelved.

The public card-index is placed in the semi-circular alcove of the main hall mentioned above. It takes the usual dictionary form, and contains at present about 900,000 standard 5×3 in. cards, to which some 36,000 are added per annum ; the printed L.C. cards⁵⁹ are used wherever possible, and contribution is also made to a co-operative scheme under the American Library Association for the production of index cards. The total accessions amount to about 20,000 volumes per annum,

with some 7500 pamphlets which include the printed and manuscript Johns Hopkins dissertations. About 6000 current periodicals are received. All books are shelved in subject order, with a view to open access ; a modified form of the L.C. scheme is used. For the convenience of research students, it has been found desirable to locate the relevant literature near the laboratories in which their work is carried out, and therefore most scientific and technical works (as opposed to those on the humanities) are shelved in the various departmental libraries.

The most important of these is the Welch Library of about 115,000 bound volumes on medical science, with an independent endowment. The structure was built in 1928 after the plans of Edward L. Tilton, one of the best known American library architects, and is planned on the most modern lines, with liberal space for students in the book-stacks. The administration is, however, centralised as much as possible in the main library, where a union card-index for the whole University is maintained. Under the inter-library loans scheme, about 430 volumes are borrowed, and 660 lent, per annum. In the bindery department, student help has been enlisted with success. In the course of last year, student-workers wire-stitched and bound 375 pamphlets, re-backed or otherwise repaired 600 defective volumes, and applied covers to 150 pamphlets ; some 7500 volumes were also prepared for the professional binder. As in some of the older American libraries, the demand for shelf space has started to present a serious problem. If the present rate of accessions continues, the librarian, Mr. John C. French, estimates that the accommodation will be exhausted in nine years ; even when all possible stack space in Gilman Hall, both in basement and loft, has been made available for books.

LIBRARY OF CONGRESS, WASHINGTON: The national (or federal) library of the United States was founded in 1800, and housed in the Capitol or seat of the American Government until 1897, when it was transferred to the present structure. The architecture is Italian Renaissance, with a content of about 13,000,000 cubic feet, and some 16½ linear miles of book-shelves. The location is within three minutes' walk of the Capitol, on the summit of a hill which commands a superb vista down to the Lincoln Memorial. With a collection of more than 4,650,000 printed books and pamphlets, this ranks with the British Museum and the *Bibliothèque Nationale* as one of the most important national libraries in the world; in what follows, the well-accepted abbreviation "L.C." will be used.

There is a special (uncounted) collection of several million manuscripts, which constitutes an authentic historical record of the War of Independence, while other departments contain about 4550 incunabula, more than a million maps, some 525,000 prints, and 85,000 bound volumes of newspapers. In addition to purchased accessions, the L.C. receives per annum under its statutes about 30,000 books and pamphlets published in America; the annual list of American doctoral dissertations is compiled on the premises. In the rare book department, which is air-conditioned and maintained at constant temperature, I was shown the smallest book in the world; the room was modelled on the celebrated Independence Hall in Philadelphia. These rare books are not available to the public, except under supervision, but photostatic copies of them are supplied on demand. The oriental division contains the most extensive collection in the West. More than 9000 current periodicals are received, exclusive of annuals and

the serial publications of learned societies. All newspapers and periodicals are bound on the premises; buckram has been found both durable and inexpensive, and is therefore used in preference to leather.

The entrance hall has ornate staircases decorated with marbles of different colours, and contains in a shrine on the second floor the Declaration of Independence and the Constitution of the United States; there is also a special collection of documents relative to Abraham Lincoln. The central domed hall, which accommodates the public card-indexes, is open to readers from 9 a.m. to 10 p.m. The dome is decorated to represent the evolution of civilisation on an international basis. Around three sides of this central hall are located the main book-stacks in nine tiers, all of which have their own shelf-lists, and are served with automatic book-lifts and pneumatic tubes for call-slips. Books are shelved in subject order, in accordance with the L.C. alphabetical catch-word scheme. Open access is allowed to *bona fide* research workers; and on the fifth floor are a number of small private studies, one of which was reserved for the writer in the course of his visit.

Books are lent out to Senators and other Government officials, also under the inter-library loans scheme; the number of such external loans amounts to about 125,000 volumes per annum. For reference use, the L.C. is as accessible to the public as a free municipal library, and records show that more than a million volumes are consulted per annum on the premises; to this number must be added the unrecorded use of research workers who have open access to the shelves. The staff consists of about 650, under the librarian, Dr. Herbert Putnam. There are at present on file some thousands of applications for appointment on the staff;

the law provides that the chosen few "shall be appointed solely with reference to their fitness for their particular duties." In 1866, the scientific department received on deposit from the Smithsonian Institution their collection of 40,000 volumes, which has since increased to about 600,000. This valuable collection consists for the most part of the research transactions of scientific societies, which the Smithsonian Institution receive from abroad in return for their own publications; and is supplemented with the L.C. accessions of American material. So far as practicable, duplication of books in the Bureau of Standards and other local departmental libraries is avoided.

From the standpoint of co-operative librarianship and documentation, special mention should be made of the world-famous L.C. printed index cards.⁵⁹ These have been issued for American material since 1898, and for other accessions since 1901; and all of them are still within the scope of the present stock, which at present numbers more than 100 million cards, and covers about 965,000 titles; it occupies about 13,000 square feet of floor space on four different levels. One standard form of card is printed for the "main entries" of books. This bears the real name of the author in full, with dates of birth and death added when practicable; the title is, as a rule, written in full; the collation comprises an adequate specification of the material make-up of the book, while contents and notes are often added. Cross-references used in the L.C. are indicated on most of the cards, for books which require additional entries other than that under the title. At the foot of each card appears the date and card number, also the classification numbers under both the L.C. and Dewey decimal⁵ schemes. All cards (which are printed

on the premises) are of the standard international size, 125×75 mm. (5×3 in.) and about 0.01 in. (0.25 mm.) thick in the best material.

The standard L.C. printed cards can be used without modification for main entries, when the shelf-mark for the book is added in the upper left-hand corner; for this purpose, the Cutter expansive scheme is recommended. If a *nom de plume* or popular name of the author be preferred, it can be written above the real name as printed on the card, either without explanation, or with the words "pseud. of" added. In a similar manner, all cross-references are written above the main reference as printed on the standard L.C. cards. These are of particular value to the research worker who wishes to build up a documentation card-index of his specialised field, since the cards lend themselves to mechanical intercalation in order of either the L.C. or the Dewey decimal⁵ classification numbers printed on them. For such purposes, the cards can be ordered in accordance with the classification scheme, on a well-defined branch of science; the price on this basis depends upon the amount of initial selection required, and works out at about 2d. per card. Before the standard cards are printed, proof-sheets are struck off with five references on each strip. These proof-sheets are sold in complete sets at an annual subscription price of 30 dollars. The entries on the proof-sheets are classified, and it is possible to subscribe to those in a desired class at less than 1d. per strip. The number of libraries, institutions and individuals who subscribe to the cards and proof-sheets has increased to about 5000 at the present time. The returns to the U.S. Government from the sale of cards, covers their cost of production, maintenance of the stock, and the salaries of 70 assistants

occupied with their distribution; this co-operative card service to outside libraries can, therefore, be said to support itself.

In course of erection on an island site at the rear, is an annex with accommodation for ten million volumes. The book-stacks (intended for artificial illumination) will form the interior of the structure, and be surrounded with administrative offices; sunshine, which is cheerful for man, is harmful for books. To the north of this annex is the beautiful Shakespeare Library, rich in manuscripts and relics of our national poet. The classical façade of white marble contrasts with the warm colours of the interior, decorated and furnished in the Elizabethan period. One of the chief treasures here is the first folio of 1623; there is also a full-size reconstruction of a Shakespearian theatre, in which dramatic performances are held. All of which is, of course, outside our present scope of scientific librarianship; however, it impressed the writer to find in the United States such hero-worship of our national poet, a common inheritance of the British and the Americans.

LIBRARY of the SMITHSONIAN INSTITUTION, WASHINGTON: Founded in 1846, the Smithsonian Institution stands on the broad Mall which forms such a superb vista from the Capitol down to the Lincoln Memorial. The little old-fashioned block contrasts with the palatial marble structures which have appeared (and continue to appear) all around, and would not lead one to suspect the important activities carried on within. To further scientific research is the chief aim, and about 30 expeditions are initiated and financed per annum. In addition, the scientific administration of numerous Government institutions (such as the Weather Bureau)

is centralised here ; this part of the work is, of course, State-supported.

Perhaps, however, the most important of activities to which the Smithsonian Institution owes its international reputation, is dissemination of the results of scientific expeditions and research, both in its own publications and in those of other learned societies over the entire civilised world. These latter are sent in bulk to the Smithsonian Institution for distribution in the United States, in return for the American material which is despatched from here in bulk to similar national depots, for distribution to the scientific institutions and libraries in the respective countries abroad. Such a world-wide scheme of distribution necessitates the maintenance of an elaborate card-index, in which is entered the name and address of each institution (space is allowed for subsequent alteration), what publications are sent to them, what are received in return, the date when the distribution was commenced, and a cross-reference number to the official file of correspondence connected therewith. Other data are also noted on each card, to serve as basis for a periodical revision of the distribution list. There is also a similar comprehensive scheme for the distribution of duplicate material, of which about 850,000 pieces are in store. These are shelved under the town-names for quick location ; the help of students for this work, is enlisted in the summer vacation.

The scientific collections of the Smithsonian Institution, acquired both as purchases and presentations, had in 1866, reached a total of about 40,000 volumes, and overcrowded the shelf accommodation. As funds were needed for scientific research, rather than for maintenance of the book collections, the latter were in 1866 deposited at the L.C. as described above, to be classified, bound

and shelved, with the proviso that the Smithsonian Institution could withdraw them on demand. In 1900, the division of science at the L.C. became known as the "Smithsonian Division." The collection at present numbers about 600,000 volumes, most of which consist of the bound transactions of scientific societies. The librarian, Dr. W. L. Corbin, has now in preparation a comprehensive index of all publications ever issued under the auspices of the Smithsonian Institution; this index will be kept up-to-date with new entries for all future publications. The writer was shown an enormous pile (which reached almost to the roof) of all Smithsonian publications issued since 1846; also the tomb of Smithson, who (we have reason to be proud of the fact) was British.

LIBRARY of the DEPARTMENT OF AGRICULTURE, WASHINGTON: The departmental offices and their various libraries are housed in a palatial modern structure within two minutes' walk of the Smithsonian Institution (described above). The main collections, with those in the sixteen branches (which form about one-third of the total), contain at present some 265,000 accessioned volumes and pamphlets. In addition to these, however, there are several thousand volumes of Government documents and pamphlets, and hundreds of periodicals, bulletins and reports in binders, which have not been accessioned. The total extent of the collections is therefore uncertain, until a complete and accurate count shall have been undertaken. The accessions amount to about 16,000 volumes per annum, of which some 2500 represent purchases, and 3600 the bound volumes of periodicals and other serials. About 4360 titles of current scientific periodicals are received, of which

1360 are purchased, and 3000 presented. In order to meet the demand for certain periodicals, however, 315 duplicate copies have to be purchased, and 325 duplicate presentations are received for circulation. The total number of current periodicals received is, therefore, about 5000, while their separate parts amount to some 78,000 per annum. The dailies (of which 150 are received) are not included in the above estimate, neither are the periodical publications of the Department, nor about 175 current farm bureau publications.

The main dictionary card-index (in which the standard L.C. printed cards⁵⁹ are used as far as possible) occupies 1300 double-ended drawers, and comprises at present about 775,000 cards; those in the special indexes of the various bureau libraries total more than two millions. Some 23,500 cards are added to the main index per annum. The special classification scheme (which has now been published in the fourth edition) comprises about 2100 sub-divisions, as compared with 230 in the first edition. The books are shelved in accordance with this scheme, and Cutter call-numbers are used to locate them within each sub-division. About 7500 books and periodicals are bound per annum; a number of the leather-bound volumes which had dried and commenced to powder, were oiled with a special preservative. The reference room is open free to the public, from 9 a.m. to 4.30 p.m. Officials of the Department are allowed open access, and a number of small studies are provided for their use in the book-stacks. The main and branch libraries show a total recorded circulation of about 70,000 books and 260,000 current periodicals per annum. Each of the bureau libraries forms a self-contained unit, and decides its own purchases, which are then ordered and received in the main accessions department. The

main card-index constitutes a union-list of all the bureau libraries, but the separate card-indexes in the latter are more detailed in respect of their own collections, and contain more elaborate cross-references.

Book-lists are compiled in response to specific enquiries connected with the work of the Department, and current reviews of certain well-defined fields are maintained in anticipation of the demand. Such work is carried out in the respective bureau libraries where the documentation is more specialised and detailed. A current review of relevant articles in newspapers (which are all scanned on their receipt) is maintained for the information of departmental officials and research workers. The staff under the librarian, Miss C. R. Barnett, numbers about 15 bureau librarians and 85 assistants. An extension of the main book-stacks now provides direct access from the periodical division and the reference room.

Special mention should be made of the "Biblio-film" service, which has been developed here on a semi-official basis. The purpose of this service, is to decrease the troublesome loan of bound volumes of periodicals, and to provide readers instead with copies of the desired scientific articles. The requisition slips are first looked up in the main card-index, and the shelf number of the periodical is noted on each; an attendant then takes the volumes from the stacks, and delivers them to the camera man to be copied. The material is classified in accordance with size, so that the table of the vertical camera can be set in one operation at the correct focal distance for all articles of the same dimensions. Under such methodical conditions of work, about 1000 exposures can be made per hour. The title-cover of the periodical is taken on the first picture of each "film-

stat" for identification of the article. When all of the articles have been copied, the roll of film is developed and dried; the various "filmstats" are then cut apart, and each is mailed to the respective client.

In order to make use of this service, a convenient apparatus in which the reduced filmstat copies can be viewed, is essential. A simple form with a 10-power lens has been produced, which can be placed on the market at five dollars. Filmstats are supplied free to the scientific staff of the Department and other Federal institutions, if needed in connection with official work; to all other clients the Biblio-film service is available at 10 cents for the first ten exposures plus 2 cents for each additional ten, which is little more than the actual cost of production. The more optimistic of its adherents claim that the Biblio-film service for copies of scientific articles, rendered *free* to the public, would prove cheaper in maintenance than circulation of the respective bound volumes of periodicals from the loans department.

TECHNICAL DEPARTMENT of the CARNEGIE LIBRARY, PITTSBURGH: The three-storied edifice of sandstone, dedicated to public use in 1895, is located in parkland some distance from the centre of the town. The main entrance is on the western façade; bronze doors open into the hall which is panelled with Tennessee marble. On the first floor are located the School of Librarianship, and the circulation department (open from 9 a.m. to 9 p.m.) in which are shelved about 60,000 representative books (and recent accessions) with open access for readers; other books of the circulation department (about 100,000 in number) are shelved in the book-stack, and are available upon call. Two broad marble staircases lead up to the second floor; the vaulted

corridor is decorated with lunettes on which are painted heads from historic Italian medals of the Renaissance period. On this floor is the reference room (open from 9 a.m. to 10 p.m.) for readers who desire a quieter atmosphere and assistance with special research work; about 30,000 enquiries are answered per annum. All reference works such as dictionaries and directories are collected in this room. At the end of the corridor is the periodical room, in which more than 1350 current periodicals and about 100 newspapers are available.

The main book-stack is built of white enamelled terra-cotta, and well illuminated from three central courts. Ventilated with washed and filtered air, this book-stack is almost dust-proof; its eleven stories are connected with an electric book-lift. The total collections number at present about 950,000 volumes, to which some 33,000 volumes are added per annum. All books and periodicals are repaired and bound on the premises; more than 100,000 volumes are dealt with per annum in this department. External loans to readers amount to more than four million per annum; about 285,000 borrowers are recorded on the loan list; the usual period of loan is two weeks.

The technical department, located on the third floor, has a scientific staff of five specialists, under the departmental librarian, Mr. E. H. McClelland, who maintains an efficient information service on the natural and applied sciences. Ever since 1895, special consideration has been shown for local industries (iron and steel manufacture) in the matter of book selection, and this has resulted in one of the finest industrial collections in the United States (about 90,000 volumes for reference and 60,000 volumes for circulation). The current technical periodicals (of which about 700 are received) are shelved

in cardboard folders with the title printed on the cover of each; loose-leaf files are used to record their due receipt. The reference room, with seats for 150 readers, has about 15,000 volumes shelved around its walls for open access; the unbound parts of current periodicals are likewise available in horizontal drawers. From 1895 to 1916, the accession list was printed in book form, and was later issued each month as a bulletin until 1928.

The present card-index, on standard 5 × 3 in. cards, consists of three distinct sections: (i) an author index in alphabetical order, with names of authors and societies, and the titles of periodicals, (ii) a subject-matter index based on the 1905 edition of the *Classification Décimale*, but with certain home-made modifications, and (iii) an alphabetical catch-word index to the obsolete and modified form of decimal classification in use; it should be noted that British, as well as American, technical terms are used in this index. When the 1927 edition¹³ of the *Classification Décimale* was published, its retrospective adoption was (for some unfortunate reason) considered impracticable; the old Brussels edition of 1905 has therefore still survived, and the books are shelved in order of the modified scheme, with Cutter numbers. There is also an extensive collection of trade publications (more than 17,000 in all) which are, however, shelved under the names of the respective firms; a separate index is used for these pamphlets. The series of U.S. patents is not classified, but an unofficial list of them is maintained for quick reference. Annotated book-lists are compiled and published in relevant periodicals; then reprinted in booklet form, and stored in box-files for sale at the nominal price of 5 cents each. The technical information service answers about 11,000

enquiries per annum ; all answers which involve research are filed for future reference. The documentation which renders possible such an efficient service, consists of a card-index in 45 drawers ; this contains references to basic sources of information, indexed under catch-words which experience has shown to be most practical in use.

PART II

JOHN CRERAR LIBRARY, CHICAGO : The most important American library devoted to pure and applied science (i.e. comparable in scope with the Science Museum Library in London) owes its existence to the bequest of John Crerar, who in his will of 1886 directed that it should be " tasteful, substantial and fire-proof, and that a sufficient fund be reserved over and above the cost of its construction to provide, maintain and support a library for all time." The first act of his trustees was to determine the character and scope of the new library : the activities of the municipal Public Library as an adequate centre for the loan of books, and the development of the Newberry Library (described in the next section) as an important reference library in certain restricted fields, influenced them in their unanimous decision to establish a free public reference library of scientific and technical literature. In collaboration with the trustees of the Public Library and the Newberry Library, an elastic scheme for the division of the field was adopted, and the scope of the John Crerar Library was defined as that of the natural, physical and social sciences, and their applications. In the years which followed, the purchase of books was commenced, a librarian appointed and staff selected ; and when in

1897 the library was opened to the public in temporary premises on Wabash Avenue, there were 15,000 volumes available for immediate use, and 7000 more in hand to be classified and indexed. In 1902 a permanent site for the library was secured on what is known as the "Lake Front" opposite the Public Library, and in 1920 the structure was completed.

The floors are not very extensive in the horizontal direction, but there are fifteen of them. This can best be described as a *vertical* library; internal transport involves the lift (but "elevator" is the correct word), since Americans do not as a rule use stairs. The main entrance hall on Randolph Street has a fine marble floor and ornamental stone walls; three elevators afford swift access to all floors open to the public. The first four are occupied with stores and offices; the book-stacks run from the fifth upward. The tenth floor accommodates the official card-index and work connected therewith, the shelf-list, continuation files and book repair section. On the eleventh are the administrative offices; the librarian, Mr. J. Christian Bay, is to be envied the extensive view from his window over the Lake Front; the cafeteria and rest room for women members of the staff are also on this floor. The twelfth accommodates the public periodical room, with its wonderful collection of about 12,000 scientific periodicals; of these, 3000 have their current issues laid out on shelves with open access to the readers, for whom 30 seats are provided. On this same floor are also located a lecture room, and the Department of Medical Sciences with its separate card-index, about 700 current medical periodicals, and seats for 55 readers; the famous Rembrandt picture "Lesson in Anatomy" appears as appropriate decoration. The thirteenth floor is occupied

with the free cloak room (where all despatch cases and portfolios must be deposited), the public lavatories, and accommodation for male members of the staff. The fine vaulted hall of the library, with its wide Gothic windows, and seats for 1200 readers, is on the fourteenth floor; some 6000 volumes of reference works (dictionaries well thumbed by crossword puzzlers) are shelved for open access around the walls, which are decorated with two fine portraits of John Crerar; just outside are the public card-indexes, the information service with a staff of four experts, and the delivery desk for books requisitioned from the stacks. The fifteenth floor accommodates the "overflow" of readers, and the union card-index of L.C. printed cards⁵⁹ and those received from the more important American universities.

The library contains at present about 600,000 volumes. The public card-index to this collection is in three divisions: (i) author, (ii) classed subject, and (iii) alphabetical subject index. It contains the titles of all books in the library, and in addition, the titles of selected articles in some 300 periodicals. The author index (i) is of the usual form, with additional names of editors and translators, also a few of the more important titles; it contains about 1.83 cards per title. The classed subject index (ii) is the one most consulted, and has been made as full as possible, with about 2.73 cards per title. It is built up on the Dewey decimal classification⁵ with few alterations but numerous expansions. Under each final sub-division, the titles are in date order, with the latest placed first. An important development has been made in that part of the classification which deals with history and the sub-divisions of place; under each political unit (country, province, state or town) are to be found the titles of all works which deal with that

place. These are further sub-divided systematically in accordance with the main classification. The result is not only that works on adjacent places are to be found adjacent also in the index, and works on part of a country follow those on the country as a whole, but also that under each place related subjects are to be found adjacent, for example: 977.3 (570) Natural history of Illinois, 977.3 (581) Flora of Illinois, and 977.3 (591) Fauna of Illinois. The alphabetical subject index (iii) serves primarily as a cross-reference from subject catch-words to the decimal sub-divisions of the classed subject index, and contains some 135,000 cards. As a rule, no entries are made in it which would duplicate those in the classed subject index; but in some cases, however, entries are made under catch-words which collect material separated in the decimal classed index, and also under catch-words which separate material collected in the latter. It therefore serves also as an alphabetical subject index of all material more conveniently consulted with such an index. This triple public card-index is supplemented with a printed list of current periodicals, a separate card-index of serials, and an extensive collection of published documentation and index services.

The official card-index on the tenth floor contains the titles of works ordered but not yet received, or reported out of print or unobtainable; this is to avoid double order. Whenever possible the L.C. printed cards⁵⁹ are used, with the addition of certain data (and occasional modification of the decimal class numbers); otherwise the library prints its own cards. In such cases 35 copies are made, to cover the requirements of internal use, distribution to sixteen other libraries, and reserve stock. The shelf-list cards are, of course, filed in the same order as the books are to be found in the stacks; that is, in

accordance first with the Dewey class number, and then in accession order within each class division. Periodical publications have ruled cards to list the number of *bound* volumes. Separate parts are entered up, when received, in the periodical room; these records are kept on a visible file until the completed volume is bound, and then noted on the shelf-list. An independent accession record is also kept for books. There are five floors of stacks, served with automatic lifts which deposit the books without shock at the desired level. Readers' requisitions are sent down from the fourteenth floor in tubes; no pneumatic pressure is needed for their propulsion. The books can, as a rule, be located and delivered within five minutes. The shelf order has been mentioned above; the books are divided into two sizes, with the exception of "out-sizes" such as atlases, which have a capital A before the shelf number to differentiate them. The shelf number is the Biscoe combination of the date and accession number, which supplements the Dewey class number on each book. For the benefit of readers who for special reasons wish to conduct research work in the stacks, a few tables and chairs are provided.

The staff consists of 60 librarians and assistants (without the operative personnel and cleaners). On account of the peculiar demands of a scientific library, applications for positions above the rank of attendant are not considered from persons not conversant with French and German; most of the staff have been trained in librarianship. About 250,000 readers visit the library in the course of a year. The recorded use, which does not include reference works taken from the open shelves, or periodicals read in the periodical room, amounts to 250,000 per annum; the total use is about three times

that number. In the information service, it has been found that technical enquiries preponderate over those on pure science, and constitute more than 60 per cent. of the total. The John Crerar Library continues to increase at the rate of 25,000 volumes per annum, and it will have ample space for expansion when the time comes.

NEWBERRY LIBRARY, CHICAGO: Founded in 1887, the Newberry collections number at present more than half a million volumes, and have acquired a reputation in the Middle West as the court of last resort for rare books and transactions of learned societies in the field of the humanities. The library is located in the unattractive northern end of the town, about 20 minutes' walk from the John Crerar (described above), with which it collaborates in the matter of reciprocal scope and book selection. The main book-stacks contain about 13 miles of steel shelves; however, as the librarian pointed out, the value of a collection cannot be computed in terms of the mere number of volumes. An educated person, skilled in the use of such material, can obtain better results from a few standard reference works, than one untutored and untrained could contrive with a roomful of books. The best results are obtained when there is an educated clientele served with a capable staff trained to the specialities of the collection. The fact that the books number about 513,000 is unimportant; their value lies in their careful selection and efficient administration. The reference room (open free to the public from 9 a.m. to 10 p.m.) has numbered seats for 150 readers, and is quiet and comfortable. Books are obtained from the stacks within 6 minutes in response to readers' call-slips, which are dated and timed on receipt. There

are about 70,000 readers per annum, to whom some 275,000 books are issued. Requisitions must be made in duplicate; one is filed under the book location, and the other under the reader's name.

In the public card-index, printed cards⁵⁹ from the L.C. are used with added cross-references; these amount to about 50 per cent of the total, and the remainder are printed on the premises. For the special use of research workers, there is also another card-index which is more detailed than the above. A form of decimal classification was in use, with Cutter numbers for shelf location; these latter are, however, to become obsolete as call numbers, and to be replaced with the accession numbers. On the cards of the location card-index is indicated whether the book is in the stacks, on the open shelves, with the binders, in the rare book collection, or loaned to a member of the staff. No external loans are allowed to the public; books are, however, placed on reserve for students. About 900 current periodicals are received, a separate title-index of which is maintained. Special application must be made for permission to use the rare book room, which is air-conditioned with atmospheric humidifiers. Small studies are available here for the use of research workers.

There is a special collection (the most extensive in existence) of books, manuscripts and atlases relative to the North American Indian. These are all entered in the main public card-index, but a more detailed documentation of them is available in the departmental index. For internal use of the librarians, an "official" card-index is maintained, in which order cards are filed until the printed cards are available. The advance L.C. proof-sheets (described on p. 177) are received and used as a basis for book selection of the American material.

The staff in the public service and technical departments number about 50 librarians and assistants ; in addition, there are on the premises 10 bookbinders who do also the work of the John Crerar collections (described in the previous section).

LIBRARY of the MUSEUM OF SCIENCE AND INDUSTRY, CHICAGO : The inception of this museum dates back to 1920, when Julius Rosenwald, its founder, visited the *Deutsches Museum* in Munich. In 1926 he formulated more definite plans, and a museum committee was appointed. South of the town, in Jackson Park, stood the old Fine Arts Museum, an architectural masterpiece in plaster which had remained from the Exposition of 1893 ; the Park Commissioners were authorised to issue bonds for its reconstruction in permanent form, to be used as a technical museum. The work was commenced in 1929, and a portion of the new museum was opened in 1933 to the public. It will be developed on similar lines to the Science Museum in London.

The library is, of course, quite a new enterprise, and will be devoted to scientific and industrial literature, with particular reference to the historical aspect and the records of inventions. The collections already amount to about 15,000 volumes, most of which have been indexed ; for this purpose the standard L.C. cards⁵⁹ have been used where possible, both for author and subject catch-word entries, which are intercalated in the same alphabetical series in accordance with the usual "dictionary" method. The books are shelved in subject order. Most of them are American, but the European material is bound in special colours to indicate French, German, and so forth ; those in Latin and Greek are considered as "dead" and are therefore bound in black.

On the shelves I noticed two volumes of the "Dictionary of Arts and Sciences" dated 1770, also an extensive file of trade publications. The current numbers of some 150 technical periodicals are laid out on racks for open access, with the "International Index to Periodicals" for reference. Copies of selected U.S. Government publications are received free.

The library is at present accommodated at street level, but will later be extended on the first floor of the museum. It is open to the public, and often receives about 200 visitors on a Sunday afternoon; to deal with popular enquiries, a newspaper file is kept on technical matters of topical interest. The more serious work of the information service consists in research for museum officers and university students; and for this purpose a catch-word information index is maintained for internal use, with cards of various colours to differentiate the entries. Annotated book-lists are compiled in response to specific enquiries. As a rule, books are not lent out direct to individuals, but inter-library loans have already been instituted to some extent. There is a separate room for children, in which 200 popular books are shelved for open access. About 500 children visit the library each month; and Miss Mary B. Day, the librarian, has prepared a list of those books which have been found most popular with her small visitors. A special collection of educational works is maintained for the use of teachers.

LIBRARY of the FIELD MUSEUM OF NATURAL HISTORY, CHICAGO: The museum is housed in a beautiful structure of white marble, massive in its proportions, and a fine example of successful adaptation to modern ideas of classic architectural motifs from the Erech-

theum, one of the temples of the noted Acropolis in Athens. It was commenced on 1915, and completed in 1920, and has a beautiful location on the Lake Front (well out from the sordid town). Since its establishment in 1893, the Field Museum of Natural History has risen to its present importance as a centre for the advancement and dissemination of science to all classes of people. It sends out expeditions for new material, and conducts scientific research; in museum technique it maintains the best traditions, but avoids dullness or pedantry in the presentation of objects. In the botanical department, some of the artificial leaves, fruits and flowers made from such materials as celluloid, wax, metal and fibre in the museum laboratories are considered to be the finest in the world.

The library, devoted to natural history, is one of the most important of its kind in America; and contains more than 95,000 scientific books and pamphlets, with many rare and valuable volumes unobtainable elsewhere. It is open to students and to the public for reference (and for the loan of books in special cases), as well as to the staff of the museum and other scientific workers. In the main library are seats for 25 readers, and an information service is maintained; there are also four smaller departmental libraries. The union card-index to the collections is of the usual alphabetical "dictionary" form, and contains all printed cards on natural history from the John Crerar Library (described on p. 186). The books are shelved in alphabetical subject order, on wooden stacks for open access; but the local atmospheric conditions are said to be bad for them. About 100 scientific periodicals are received (some of the sets date back to about 1893); the current numbers are laid out in alphabetical title order in enclosed drawers

to keep them clean, and are subsequently bound on the premises. There is a remarkable collection of works on bird life, with many rare and beautifully illustrated volumes of Audubon, Bonaparte, Buffon, Elliot, Gould, Lilford, Sclater, Seebohm, Temminck, Wilson and other noted authorities. Accessions to the library are acquired as purchases, or in return for publications of the museum. These, as well as labels and even colour work, are all printed on the premises, and are sent out to universities, public libraries, scientific societies, academies and other institutions in the United States and abroad.

LIBRARY of the UNIVERSITY OF CHICAGO: The collections were started in 1892, and later transferred into the present structure, known as the Harper Memorial, which was opened in 1912. This has a pleasant location on the broad open boulevard which leads down to Jackson Park on the lake-front; but for practical purposes, it would appear to have been planned without adequate provision for the future, since in 1917 all available shelf space had become overcrowded. The main collections, with those in the 29 departmental libraries, now total about 1,150,000 volumes. Since the book-stacks in 25 of the departmental libraries have now become almost filled, and the accessions amount to some 40,000 volumes per annum (about 5260 current periodicals are received), the question of shelf accommodation presents a serious problem. Two proposals have been put forward: (i) to extend the old Harper Memorial to hold 5,000,000 volumes, and (ii) to build a new "science center" to take the overflow of older material from the departmental libraries, in order to leave their shelves free for current research publications. In the latter alternative, the

Harper Memorial would become reserved for books on the social sciences and humanities.

Due no doubt to its Gothic architecture, this block has an ecclesiastical atmosphere. The reference room is open free to the public, from 8 a.m. to 10 p.m. The main card-index contains entries for all collections in the departmental libraries, with reference to their location; there are separate author and catch-word indexes. For classification, the L.C. scheme is used; it should be pointed out that the L.C. classification is more suitable for such extensive libraries, than for specialist collections which require the finer sub-divisions of the decimal classification. The books are shelved in order of the L.C. scheme, with Cutter numbers for their precise location. There are two stories of book-stacks in the basement. On the second floor is a special collection of documents relative to Abraham Lincoln, the hero of American freedom. The total staff under the director, Mr. M. L. Raney, consists of about 100 librarians and assistants. Each of the departmental libraries has a technical staff of specialists, who maintain their own documentation services (more detailed than would be possible in the main card-index), and advise on the purchase of new books. The collections in these branch libraries, which are located near the laboratories, consist for the most part of research pamphlets and current periodicals, and it has been found convenient to shelve such material unbound in cardboard boxes.

GRADUATE LIBRARY SCHOOL, UNIVERSITY OF CHICAGO: Established in 1926 as the result of an active movement on the part of American librarians to provide a professional institution devoted to research in librarianship, and opened to students in 1928, this School is

unique in the status of its educational scheme. The standard courses, of which 36 are offered, deal with the common problems and methods of librarianship; for more advanced students, the seven sections of the research course provide ample scope for individual work of a doctorate character. In addition, there are 10 courses in librarianship related with other departments of the University, such as book illustration, economics, education, political science. While the School has its own internal administration, these courses are planned in intimate collaboration with the other respective departments, inasmuch as the more advanced aspects of librarianship do not constitute independent studies, but are inter-related with other fields and activities. Thus the librarian who has to deal with scientific books and answer readers' enquiries, must be trained both in science and in librarianship, and must know how to correlate the two. The rapid increase of libraries in the United States since 1850, has been one of the notable phenomena of American educational and social development; public libraries have arisen to meet the needs of urban and rural populations, while special libraries have evolved in commercial and industrial work.

The opportunities which this School provides, with its own courses and those related with other departments of the University, are intended for those who wish to equip themselves for work in public or educational libraries, or as librarians of special collections such as law, medicine or science. For research students, no hard-and-fast curriculum is prescribed; instead, an attempt is made to adapt the schedule of each to suit his (or her) previous preparation and plans for the future. There are at present about 20 full-time students in the School, most of them men; it should be noted

that, even in America, librarianship now tends to become a more masculine profession. All the important current periodicals on librarianship are received, both from the United States and abroad. Since one of the purposes of the School is to promote the publication of important studies in this field, the "Library Quarterly" was established under its auspices in 1931, with a board of editors composed of eminent librarians in America and abroad. The main purpose of this periodical is to stimulate the authoritative treatment of certain aspects of librarianship, and the present writer has had the honour to contribute ⁶⁷ to some of its recent numbers.

LIBRARY of the UNIVERSITY OF MICHIGAN, ANN ARBOR: The central library stands in open parkland such as surrounds most of the American universities. The present structure was built in the years 1917-1919, on the site of a former one; the old book-stacks were not demolished, but have been incorporated into the new scheme. This is a handsome piece of modern architecture with four floors above the basement; but the exterior, with its deep upper windows, does not confess to more than two stories. With its nineteen branches in the various faculties, the library contains at present about 935,000 volumes; this does not include some 125,000 unbound pamphlets. The accessions amount to about 27,000 volumes per annum, and some 4300 current periodicals are received. In recent years, however, the excessive price of German periodicals (coupled with devaluation of the American dollar) has

⁶⁷ Spratt (H. Philip), "Notes on some scientific and technical libraries of Northern Europe." *Library Quarterly*, vol. IV, no. 3 (July, 1934), pp. 467-486.

Spratt (H. Philip), "Further notes on scientific and technical libraries of Northern Europe." *Library Quarterly*, vol. IV, no. 4 (October, 1934), pp. 628-638.

caused some consternation to the librarian, Mr. William Bishop, and a number of subscriptions have had to be cancelled.

The main card-index is of the usual "dictionary" form, with author, title and subject entries in the same alphabetical series. The call number, which locates the book on the shelves, is found in the upper left-hand corner of each card; a name stamped above the call number indicates in which particular branch the book is to be found. In the course of last year, about 182,000 cards were added to the index, of which 12,800 were printed in Ann Arbor. There are seven floors of stacks at the rear of the library, where the books are shelved in subject order; the stacks are not as a rule intended for open access to readers, but about 700 stack-permits were issued in the course of last year. Shelf accommodation presents a serious problem, as the limits of these overcrowded stacks have now almost been reached. Books are, as a rule, delivered to readers within ten minutes. The result of a week's test at the delivery desk show that out of 6620 requisitions, 4520 books were delivered to the readers at once, and reports as to the location of 1775 more were supplied within a few minutes; thus 95 per cent were accounted for. Further search enabled 99 per cent to be located within 24 hours; that the small remainder were not found, was due in most cases to errors in the readers' requisitions.

The main hall of the library (open from 7.45 a.m. to 10 p.m. on weekdays in term-time) is situated on the second floor across the north front. Around the walls are about 10,000 volumes of reference works, dictionaries and year-books, which can be taken from the shelves without written requisition. An increase in the number of enquiries for material on the natural and

technical sciences is reported. The periodical room contains the current numbers of about 1600 periodicals in racks fitted with doors; these are on open access, and an index is provided on one of the tables. Periodicals are not allowed out on loan. The recorded use of books in the library is about 575,000 per annum, to which must be added the unrecorded use on the part of readers with stack-permits, as well as books and periodicals taken from the open shelves. External loans amount to about 240,000 per annum; as inter-library loans, 630 books were borrowed, and 2030 were lent, in the course of last year. The photostat department turns out some 27,000 prints per annum. For the use of research workers, there are a number of special studies, each of which contains a collection of works devoted to the particular field for which the room is equipped.

TECHNICAL DEPARTMENT of the DETROIT PUBLIC LIBRARY, DETROIT: The foundation dates back to 1865, when a collection of 5000 volumes was opened to the public in makeshift premises on Capitol Square, which were soon found to be inadequate. The present (third) location is on the west side of Woodward Avenue, about 15 minutes' walk from the centre of the town. The foundation was laid in 1915, but construction was not completed until 1921 on account of the war. This beautiful edifice of white Vermont marble is surrounded on all sides with a broad balustraded terrace, the floor of which is paved with brick and Indiana limestone panels. The ample site enabled the structure to be placed well back from the street with an approach of paved terraces across the lawns, which affords an ensemble view from the proper distance. There are four stories,

but the façade (in Italian Renaissance architecture) does not show more than three.

Massive bronze doors open into the entrance hall with its fine Doric colonnade of Tennessee marble. On the left is the newspaper and periodical room, where more than 7000 current titles are received; opposite is the children's department, in which the decorative fireplace deserves special mention. The main staircase leads to the mezzanine floor, on which are located most of the administrative offices, and continues to the second floor. Here is the main hall of the circulation department, 75 feet square in floor area and palatial in proportion. A narrow hall on the left contains the cabinets of the public card-index; and on the other side of this is the reference room, open to the public from 9 a.m. to 9 p.m. Here are shelved (for open access) about 5000 of the most-used reference works; pneumatic tubes communicate with the main book-stacks which extend across the whole of the rear façade. The total collections number at present about 850,000 volumes and 350,000 pamphlets. Annual circulation amounts to more than six million volumes. On the second floor is also a "Civics Room" which functions as a special reference room for current information on economics and social science.

The technical department, formed in 1917, is located on the third floor, and now contains more than 70,000 volumes, of which some 33,000 are available for circulation. The scope is confined to technical and industrial work, and excludes the natural sciences. In collaboration with 16 special libraries in Detroit, a comprehensive information service is maintained, with particular reference to local industries such as automobile manufacture. In the research room are shelved (in alphabetical

order) the bound volumes of technical periodicals and transactions, of which about 600 current titles are received. These were at first placed on open access, but the alcove formation of the shelves resulted in cases of mutilation to the volumes, and a rail was therefore erected to exclude the public. There is a complete file of U.S. patents, with abstracts of the British and Canadian. About 12,000 trade pamphlets are available in vertical files. All reference works are shelved in accordance with the Dewey decimal classification,⁵ but no open access is allowed. Books are issued for consultation in the research room on deposit of the reader's ticket. The information service maintains for internal use a card-index of source material, in which entries are made under such catch-words as have been found to be most practical for quick reference. Book-lists are compiled in response to specific enquiries, and some of them are revised at certain periods with the addition of new material. Photostat copies of technical articles are made on the premises, and supplied to readers at cost price.

The circulation room has seats for 50 readers, and shelves around the walls contain about half the collection (new books and those in frequent demand) on open access. The books are placed in systematic order (a modified form of the Dewey classification is used), so that the uninitiated public can often find the desired material without reference to the departmental card-index. This is maintained in the usual "dictionary" form; the L.C. printed cards⁵⁹ are used wherever possible, with added cross-references. The author entries duplicate those in the union card-index on the second floor, but the classified entries are peculiar to the technical department. There is also a separate shelf-list on 5 x 3 in. cards, in which the bound volumes of periodicals are

added when shelved. Books in the reference collection are represented with "dummies" on the circulation shelves; these dummies consist of wooden blocks, one inch or more in thickness, and are used as a simple form of cross-reference for the public who do not consult the card-index. The covers of new books (which often contain short reviews of their contents) are exhibited on a notice board for information of the public. The departmental staff under Mr. C. M. Mohrhardt consists of nine technical specialists for the documentation service, with seven assistants for the clerical and operative work.

PUBLIC LIBRARY, CLEVELAND: Established in 1869, and opened free to the public from the start, with books for both reference and circulation, this was one of the first important libraries in the world to place their bookshelves on open access for readers. The present structure was completed in 1925 as part of a municipal plan in the heart of the town; the exterior is of marble, French Renaissance in period. There are six stories with the basement, and mezzanine floors over certain areas provide accommodation for extra tiers of bookstacks. Most of the perimeter is devoted to divisional reference rooms, inside of which is a belt of bookstacks; the Brett Memorial Hall on the first floor rises two stories in the central area, above which is an open court left to provide window-space and ventilation.

On the left of the main entrance is the public card-index in 3500 drawers with more than 3,500,000 cards, in which 430,000 are added, and about 75,000 revised, per annum. This index is of the usual dictionary form, with alphabetical entries for authors and titles, and catch-word entries for subject-matter. The location

of each book is indicated on the card. On the other side of the entrance hall is the loan division and desk for the return of books; external loans to readers amount to about 9,750,000 volumes per annum, and there are some 325,000 borrowers on the loan-list. In addition, more than nine million readers consult the reference collections per annum. In the basement is the newspaper room, in which the current numbers of about 200 newspapers are available. The department for the blind contains about 4900 embossed volumes, which are mailed free to blind readers under U.S. Government frank. In all, there are sixteen divisional reference rooms (open from 9 a.m. to 9.30 p.m.) with accommodation for 2000 readers. Each division has open shelves around the room, a card-index and shelf-list of its respective collection, and a specialist staff of librarians. Most of them have direct access to the relevant section of the main book-stacks. These are on 13 tiers and, with 47 miles of shelves, were planned to accommodate two million volumes. The total collection at present numbers 1,875,000 volumes and 37,000 pamphlets; there are also 233,000 pictures and more than 1000 manuscripts. The accessions amount to about 65,000 per annum. Current periodicals to the number of 4750 titles are received, exclusive of newspapers. About 125,000 volumes are bound or re-bound on the premises, and minor repairs made to 350,000 per annum. The total staff under Miss L. A. Eastman is 1100, inclusive of librarians and all operative personnel. There are 32 local branch libraries in other parts of the town.

The scientific and technical department is located on the second floor, and contains at present about 75,000 volumes devoted to science and the useful arts, of which more than 23,000 are available for circulation. A

special effort is made to acquire practical books on trades and industrial occupations, and reliable works on scientific research. For their classification, the Dewey decimal scheme⁵ is used. About 1600 current technical periodicals and transactions of scientific societies are received, most of which are bound for permanent reference. The patent room contains more than 5000 volumes of United States patents; it has unbroken files of British and German patent records, and a partial file of French and Canadian patents. Most of the U.S. Government publications are received, such as those of the Bureau of Mines and the Bureau of Standards. The technical staff aids readers in special research work, and compiles book-lists in response to specific enquiries. A photostat equipment is available, in order to provide research workers with facsimile copies of patents and other valuable technical material.

TECHNICAL DEPARTMENT OF BUFFALO PUBLIC LIBRARY, BUFFALO: Founded in 1836, the central collections are housed on an island site (with space for future extension) in the heart of the town, and total at present about 650,000 volumes and 61,000 pamphlets; more than 770 current periodicals are received. The well developed technical department, under the direction of Mr. T. L. Mayer, contains about 30,000 volumes devoted to pure and technical science, more than half of which are available for circulation. The books are shelved in accordance with a modified form of the Dewey decimal scheme,⁵ and this is said to be the second important library in the United States to have adopted that classification for scientific literature. About 225 current technical periodicals are received, but these are not available for external loan. Not all of the periodicals are bound for

permanent preservation; separate parts of the less important are shelved for two years, and then either disposed of, or clipped for the reference files of the information service. The departmental reference room (open from 9 a.m. to 9 p.m.) has seats for 50 readers, and contains about 3500 volumes on open shelves. The remainder of the reference collection are on reserve. There is a special collection on architectural construction, most of which is accommodated on oversize shelves; I also noticed a fine series of plates to illustrate some of the historical achievements in scientific research and invention, and a collection of about 800 portraits of prominent scientific and technical men.

The public dictionary card-index covers both the circulation and reference collections in the same alphabetical series, with the shelf location of each volume. There is also a separate index to the collection of about 3000 trade publications, which are classified and cross-referenced under the names of the respective firms. New books are exhibited for two months in the reference room, where the current numbers of about 150 technical periodicals are also shelved for open access. Most of the material deals with American practice; the public do not appear to take much interest in European technical developments (perhaps on the supposition that America leads the world). Quite an appreciable number of the books were in Polish, to suit that national element in the population of Buffalo. All volumes are bound on the premises. The information service deals with some 20,000 enquiries per annum; those which entail research are filed for future reference under suitable catch-words. Records show that about 50,000 readers make use of the reference room, and that 30,000 external loans are issued per annum.

RESEARCH LIBRARY of the BUFFALO MUSEUM OF SCIENCE, BUFFALO : This museum is located in a quieter part of the town, about 20 minutes' drive out from the central Public Library ; one of its most remarkable exhibits is a transparent model of a man, a fine piece of anatomical reconstruction. The library is small, but comfortable and quiet : ideal for research work. No books are loaned outside the premises, since the library is intended primarily for members of the museum staff ; however, the public are also admitted, and fifteen seats are provided for the use of visitors. So far as textbooks are concerned, the collections are not rich ; but, as in most scientific research libraries, particular importance is attached to current serial publications, and of these there are about 16,000 bound volumes with about the same number unbound. Most of the more important sets date from about 1863 onward, and are laid out on neat wooden shelves around the room ; these wooden bookshelves impressed me with their pleasant restful appearance, after the ultra-modern steel stacks to which I had become accustomed in America. The card-index contains author and subject catch-word entries, as well as the titles of serial publications, in the same alphabetical series (i.e. in the usual " dictionary " form). The museum issues a periodical Bulletin in return for other serial publications on natural history and related subjects which the library desires to acquire for research purposes ; it does not cater for the popular reader.

TORONTO PUBLIC LIBRARY, TORONTO : The most important of Canadian public libraries celebrated its semi-centennial in 1933 ; but has a much older tradition as descendant from that of the Mechanics Institute

which was established in 1830 at the old town of York, before the latter became incorporated under the name of Toronto. A publication of 1851 states that the collection then amounted to 1300 volumes. Towards 1880, the old Institute had become inadequate for the needs of Toronto; about the same time, alderman John Hallam returned from a tour in Great Britain where he had made studies of our libraries, and in 1881 he moved that a municipal public library should be established. An administrative Board was constituted in 1883 with Mr. Hallam as the first chairman, and the library was opened to the public. There have since been but two chief librarians: Dr. James Bain until the time of his death in 1908, and then Dr. G. H. Locke who still holds office.

There are seventeen branches in addition to the central collections which are housed in a fine modern structure near Queen's Park; these total at present about 590,000 volumes, of which 420,000 are on circulation, and 150,000 are for reference, with an extensive collection of about 16,000 patents. The children's department is accommodated in a converted mansion at the rear, and forms an important social centre for its small patrons. The main hall of the reference division (open from 10 a.m. to 9.30 p.m.) has seats for 220 readers, and contains about 3500 volumes on open shelves. Some 300 current periodicals (other than newspapers) are received, of which more than 100 are scientific and technical; the Kardex method is used to check their due receipt. The information department receives and answers about 6000 enquiries from readers per annum; the telephone service has proved a most important part of their work for extra-mural patrons. All answers to enquiries are filed for future reference under popular catch-words.

The new technical collections are shelved for reference in the Hallam Room (named after the founder). For their classification, the Dewey decimal scheme⁵ is used; the books are divided into about 30 classes, and shelved in separate alcoves. Dummies are used on the open shelves of the main reference room, to indicate technical books which are available in the Hallam Room. This practical device for cross-reference on the open shelves is said to have proved useful, but it would appear to take up much valuable space. The public dictionary card-index contains alphabetical author, title and catch-word entries, with the shelf location and cross-references indicated on the back of each card. The printed L.C. cards⁵⁹ are used for about 45 per cent of the total, with added cross-references; other cards are handwritten. On these latter, titles are also entered in the Russian and Yiddish characters, separate alphabetical indexes of which are maintained. Tables at elbow level near the card cabinets are convenient for readers. There is a separate shelf-list in order of the Dewey decimal classification,⁵ and an official card-index for internal use. The latter is filed in steel drawers 15 in. wide, with the cards three abreast. The advance L.C. proof-sheets are received, to facilitate subsequent orders for the cards, and as a basis for book selection. About 110,000 cards are filed per annum. The main book-stacks are in five stories of reinforced concrete with steel shelves, and are provided with electric book-lifts. Maps and similar oversize folios are laid out flat in horizontal drawers. There is a book-binders' workshop on the premises, in which about 35,000 books are repaired and 10,000 rebound per annum; in addition, more than 300 volumes of newspapers and periodicals are bound, and 550 pamphlets covered, per annum. Records of the circu-

lation division show that more than four million books are lent per annum ; there are about 270,000 borrowers on the loan list.

MCGILL UNIVERSITY LIBRARY, MONTREAL : As we proceed eastward from Toronto, we hear more French spoken. In Montreal there are two universities : McGill for the British, and the *Université de Montréal* for the French-Canadians (who are, however, none the less British). The main collections of McGill number at present about 350,000 volumes and 45,000 pamphlets. The reference room (open free to the public from 9 a.m. to 10 p.m.) has accommodation for 150 readers ; separate table lamps are provided for all. The beautiful roof and mural decorations produce an ecclesiastical atmosphere, while flowers on the desks add a welcome touch of colour and freshness to the room. Around the walls are shelved the most important reference works for open access, and the books prescribed for special courses.

The public card-index is of the usual form, with author, title and catch-word entries in the same alphabetical series. The main author cards have the cross-references noted on the back ; catch-words are printed or written in red. The standard L.C. cards⁵⁹ are used where possible. Three smaller rooms are also available for public use (there is no municipal library in Montreal), and 25 studies are provided for research students (to whom special permits are issued) in the main book-stacks. These are on six floors, and have wooden shelves on steel supports, while more modern all-steel shelves are used in the annex. The books are shelved with the help of Cutter numbers ; architectural folios are laid flat. Here are shelved the collections for all faculties, except that of medicine. The air is conditioned with

artificial humidifiers, and Holophane prismatic electric lamps are used for efficient illumination. About 3000 current periodicals are received, 500 of which are available on open access in the periodical room. External loans are issued on deposit of five dollars, which is returnable. A periodical list of the more important accessions is published for the information of readers. The alphabetical card-index of borrowers is divided between three assistants for administrative purposes. Of interest to confirmed "book-worms" is the Museum of the History of the Book, a unique feature which deserves special mention. All books are repaired and bound on the premises. New accessions are entered in a loose-leaf book with full particulars of their acquisition; orders for new books are filed on 5 x 3 in. cards. The total staff consists of 35 librarians and assistants.

BIBLIOTHÈQUE de l'ÉCOLE DES HAUTES ÉTUDES COMMERCIALES, MONTRÉAL: Founded in 1907 under the provincial Government of Québec and opened in 1910, the École des Hautes Études Commerciales was affiliated in 1915 to the *Université de Montréal*, in which it now forms the department of commerce and school of business administration. The *bibliothèque* is housed in a converted mansion next door to the School, with which there is direct corridor communication. The collections number at present 32,000 volumes on commercial and industrial science, and 3500 pamphlets (commercial theses for the most part). About 350 annual reports and 800 current periodicals are received from all parts of the world, the relevant articles in which are filed for the reference of students interested in economic research. The current numbers of most periodicals are available in the various reference rooms, which are open free to

the public from 9 a.m. to 10 p.m. The more important commercial works of reference are also placed on open access for readers. The card-index is on standard 5 × 3 in. cards, and contains alphabetical author, title and catch-word entries, with the shelf-location indicated on each card. The book-stacks have wooden shelves, and there is an extensive collection of maps which are laid out flat in horizontal drawers. New accessions are exhibited for a short period in special racks for the information of readers. External loans are issued to the public, but a returnable deposit is required to cover the value of the books borrowed.

BIBLIOTHÈQUE de l'UNIVERSITÉ LAVAL, QUÉBEC : The foundation of the Université Laval dates back to 1852, when a charter of incorporation was received under Queen Victoria. There are 20 departmental libraries in the various faculties and schools, in addition to the *Bibliothèque Générale* which is still housed in the old *Pavillon principal de l'Université* built in 1860. This resembles an old French *château* in architecture ; the *bibliothèque* occupies three of the upper floors (all of polished inlaid wood). The old-fashioned charm of the reference room provides a quiet and comfortable atmosphere for research work ; from the windows, a fine view over the river Saint Lawrence is obtained. The rich carved wooden book-cases formed a pleasant contrast to the ultra-modern pressed-steel equipment seen in other American libraries. The total collections of the Université Laval amount to some 625,000 volumes ; of these, about 215,000 are shelved in the *Bibliothèque Générale*, where more than 400 current periodicals are received (most of them as purchases). Open access is allowed, to enable readers to choose (but not to remove)

their books from the shelves. Certain of the more valuable books (such as the beautiful illuminated manuscripts of which there is a fine collection) are not on open access, but can be consulted under supervision. External loans are issued to professors; but not to students, to whom books are circulated from their particular departmental libraries. In the matter of book-selection, there appeared to be no co-ordination between the departmental libraries and the Bibliothèque Générale to avoid duplication of material.

The card-index was maintained on narrow vertical cards, similar to those which I had seen in the *Bibliothèque Nationale* at Paris; it contained author, title and catch-word entries in the same alphabetical series. There was also a separate shelf-list in order of the classification scheme; numerals were used (but not as decimals) for the sub-divisions. In the *Salle des Revues* the current numbers of periodicals and transactions were laid out for open access to readers; the more important were bound on the completion of each volume. The information service compiled book-lists for research workers, in response to specific enquiries. More than 75 per cent of the collections consisted of French material.

While at Québec, which to a casual observer could almost be mistaken for a French town, the writer was also able to visit a small collection of about 3500 volumes at the new *École Supérieure de Chimie* which is later to be developed into a *Faculté des Sciences*, about six miles outside the town. The books were placed (on wooden shelves) near the laboratories where the material would be needed for research work. In the selection of books, special consideration was shown for the local chemical and wood-pulp industries; most of the books were in

French. The card-index was on the same narrow vertical cards as those used in the Bibliothèque Générale (described above); it contained author, title and catch-word entries in the same alphabetical series, with about three cards to each volume. There was also a separate location index based on the classification, for which a home-made numerical scheme was used. To avoid inconvenience to the research workers (who numbered about 35 in the École), periodicals were bound in the summer vacation.

BIBLIOTHÈQUE de la FACULTÉ DE MÉDECINE, UNIVERSITÉ LAVAL, QUÉBEC: A municipal school of medicine has existed at Québec since 1847 with about 20 students, and the staff of the *Faculté de Médecine* founded at the Université Laval in 1853 was recruited from its professors. From that time onward, medical books were accumulated for the educational and research purposes of the new *Faculté*, but it was not until 1921 that the modest collection of 800 volumes and 150 pamphlets became a self-conscious *Bibliothèque* with modern card-indexes and all the other appurtenances of American librarianship. The collections number at present about 5100 volumes and 1100 pamphlets (medical dissertations for the most part), while 150 current medical periodicals are received.

The dictionary card-index contains alphabetical author, title and catch-word entries, on which are indicated the shelf-numbers; in addition, there are title cards for all medical periodicals and transactions in the main Bibliothèque de l'Université Laval (described on p. 213), and in the *École de Médecine*. The entries under each catch-word are intercalated in accession order, which enables research students to find the most recent material at

once. All books are shelved, as received, in accession order and irrespective of their size, since there is (at present) ample vertical space, and students are not allowed open access to the book-stacks. Periodicals are, however, placed in alphabetical order of their titles, with the unbound parts in cardboard boxes. The reference room has seats for 20 readers, and is open from 10 a.m. to 5 p.m. External loans are issued to students of the *Faculté*, but not to the public. One of the most important documentation sources for research students is the "Index Medicus" which contains references to current articles in medical periodicals over the entire world.

As mentioned above, Québec could, to a casual observer, almost be mistaken for a French town. In some respects, it even recalled to me the traditions of mediæval France; thus the Old World did not seem *quite* so old in comparison, even as I embarked for conservative old London.

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